THE BRICKBUILDER

VOLUME XIX DECEMBER 1910 NUMBER 12

PUBLISHED MONTHLY BY ROGERS & MANSON

85 Water Street - - - Boston, Massachusetts

Entered at the Boston, Mass., Post Office as Second-Class Mail Matter, March 12, 1892.

Subscription price, mailed flat to subscribers in the United States, Insular Possessions and Cuba . . . . . $5.00 per year
Single numbers . . . . . 50 cents
Subscription price, mailed flat to subscribers in Canada . . . . . $5.50 per year
To Foreign Countries in the Postal Union . . . . . $6.00 per year

SUBSCRIPTIONS PAYABLE IN ADVANCE

For sale by all news dealers in the United States and Canada. Trade supplied by the American News Company and its branches.

ADVERTISING

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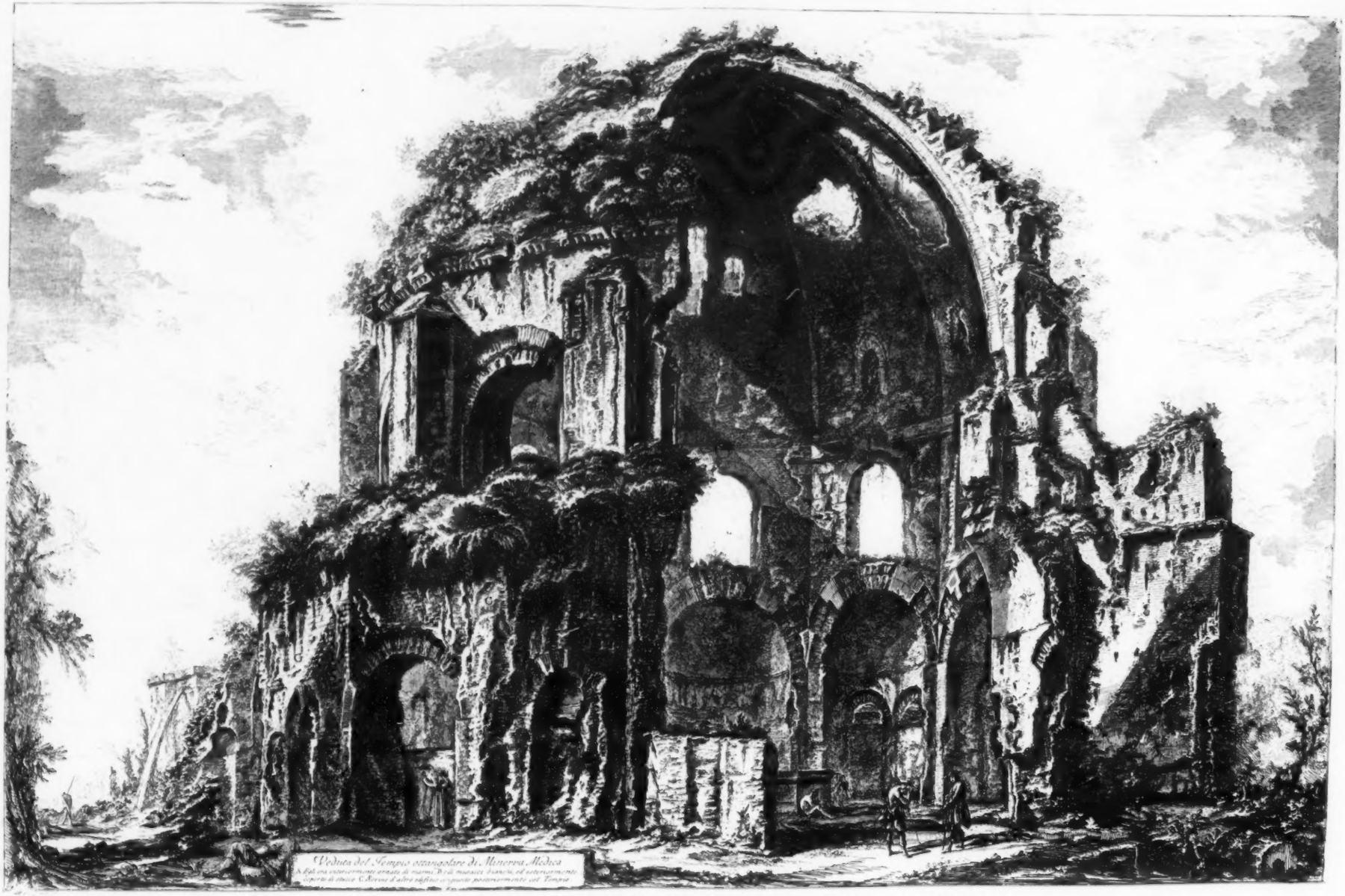
FROM WORK BY

BLISS & FAVILLE; FREDERICK JUNIUS STERNER; GEORGE T. TILDEN.

LETTERPRESS



VIEW OF THE RUINS KNOWN AS THE TEMPLE OF MINERVA MEDICA.

GIOVANNI BATTISTA PIRANESI, DEL.

This structure consists of a large ten-sided hall, 27 yards in diameter, covered by a cupola 90 feet high, with four surrounding apartments. On nine sides of the interior are niches for statues, [illegible] the entrance passed through the tenth niche. Above the niches are roundheaded windows. The roof was of vaulted brickwork, the pavement of porphyry, and the walls were ornamented with stucco and marble. The building probably formed the central feature of the pleasure grounds and baths of the Emperor Gallienus (died 268 A.D.) situated between the Porta San Lorenzo and the Porta Maggiore. The railway pierces the walls near the Porta Maggiore and part of the site of the old gardens is occupied by railway yards.

THE BRICKBUILDER

VOL. XIX. NO. 12. DECEMBER, 1910.

Hints on Architectural Acoustics.

Continued.

BY HUGH TALLANT.

PART III.

Illustrative Examples.

PART I of these papers outlined the theoretic principles of architectural acoustics. Part II showed how these principles could be turned to practical advantage. The third and final part will consider the treatment required by special types of construction. For this purpose it will be found convenient to adopt a classification according to size; and the fact that the direct sound can be readily understood to a distance of only 50 feet furnishes a natural standard of measure. On this basis every variety of auditorium may be assigned to one of three groups — those having no dimension exceeding 50 feet, those having only one dimension exceeding 50 feet, and those having two or all three dimensions in excess of 50 feet. The effect of differences in shape, material, contents and arrangement may then be discussed with reference to the group into which the auditorium in question happens to fall.

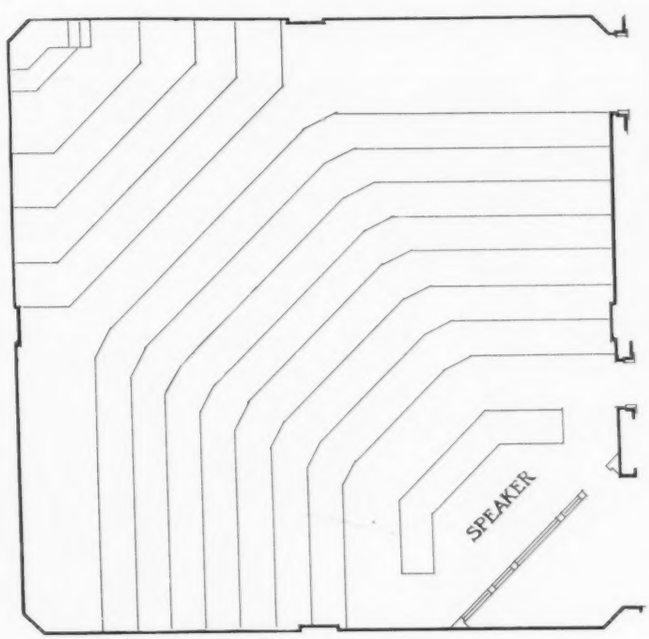


FIG. XLII.

Auditoriums Having no Dimension Over 50 Feet. Where no dimension exceeds 50 feet the audience is necessarily so near the speaker that the sound is always loud enough, and under ordinary conditions of material and construction the initial intensity is more than sufficient to drown out any serious defect of sound interference. The deflections occur with such rapidity as to forestall the possibility of interrupted reverberation or echo, and the acoustic problem is usually reduced to little more than an adjustment of materials and contents with reference to the desired amount of reverberation. As mentioned in a previous article the reverberation best adapted to musical purposes seems to increase from 1.00 second for a volume of 2,500 cubic feet to some 1.35 or 1.40 seconds for a volume of 30,000 cubic feet. For speaking purposes a slightly shorter reverberation is preferable, at any rate in small rooms. The methods of calculation and adjustment have already been fully illustrated* and need not be repeated here.

General arrangement is, however, of some importance even in a very small auditorium. The acoustics are almost always benefited by placing the speaker or musician on the short side of an oblong room and in the corner of a square one. Figs. 42, 43 and 44 give the floor plan, the ceiling plan and the general interior appearance of a small lecture hall arranged in

*See THE BRICKBUILDER for November, 1910.

the latter way. This particular hall is about 47 feet square and contains 41,000 cubic feet. The wooden floor is uncarpeted, the seats are not upholstered, and there are no draperies except a screen for photographic projections. Under these conditions the absorbing capacity is mainly dependent upon the size of the audience. This hall was designed before the precise coefficients of absorption had been determined, but the danger of excessive reverberation was sufficiently evident without accurate calculation. To guard against this defect a number of heavy beams were furred across the ceiling for the purpose of deflecting the sound to the floor as quickly and repeatedly as possible. It was hoped in this way to minimize the reverberation when a portion of the seats was unoccupied, and in point of fact the desired result seems to have been attained, as a reduction in the size of the audience does not affect the acoustics so unfavorably as calculations would give reason to expect.

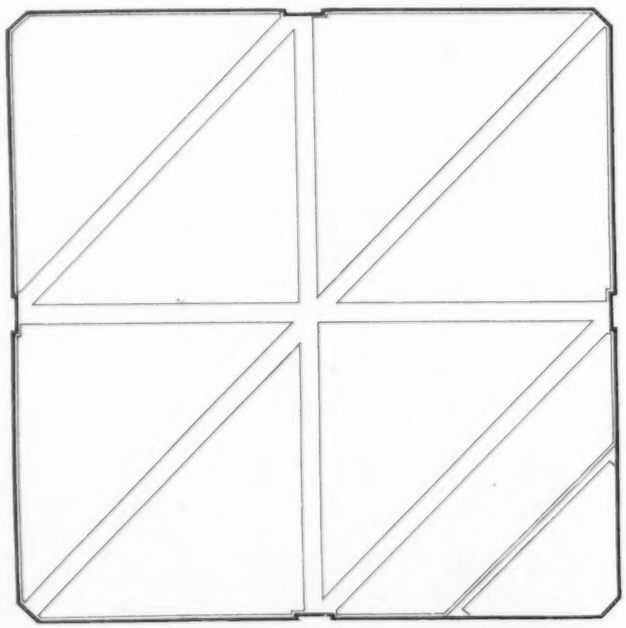


FIG. XLIII.

AUDITORIUMS HAVING ONLY ONE DIMENSION EXCEEDING 50 FEET. In auditoriums of this class it is usually preferable to place the rostrum at one end, thereby permitting a speaker or singer to command his audience more readily than from the center of one of the long sides. There is rarely any danger of insufficient loudness toward the rear, as auditoriums of this class seldom attain a length of 100 feet, and the direct sound is sufficiently reinforced by deflections from the walls and ceiling. For orchestral music this arrangement has the great advantage of reducing the number of front seats where the tones of the different instruments are apt to be imperfectly blended. Figs. 45 and 46 show the plan and longitudinal section of a typical auditorium of this class. As will be noted the floor at the rear is not quite high enough to prevent sound interference, and a false beam has therefore been contrived at B. The cross beams C were required by a special lighting scheme, but are a distinct detriment to the acoustics, as they interfere with the sound which would otherwise be deflected from the ceiling to the rear seats. They also have a tendency to create interference.

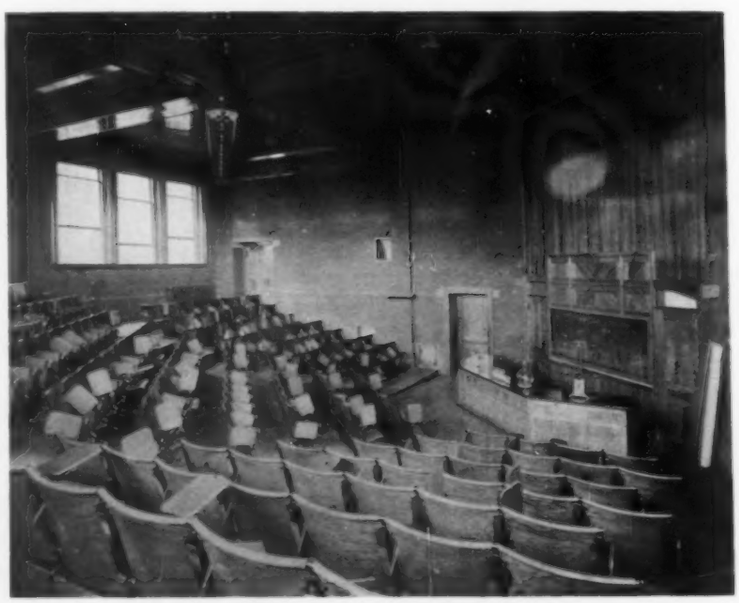


FIG. XLIV.

AUDITORIUMS HAVING TWO OR ALL THREE DIMENSIONS IN EXCESS OF 50 FEET. Auditoriums of this class not infrequently allow considerable latitude of architectural treatment, and in particular may vary largely in shape and proportion provided that the requisite seating capacity is maintained. Frequently the arrangement is dictated by considerations of sight rather than hearing. In a well designed house the audience should hear almost as well 100 feet from the stage or pulpit as in the front rows — better in a music hall or opera house — but at

such a distance facial expression and many niceties of gesture are totally lost without a glass. There is accordingly an advantage in keeping a large auditorium as shallow as possible, provided always that the width is not so great as to prevent the speaker from readily commanding his audience. A megaphone-shaped auditorium may be extremely wide because the undesirable seats at A and B, Fig. 47, are eliminated. A rectangular auditorium, on the other hand, must be kept relatively narrow because otherwise the speaker is obliged to turn continually to right and left in order to address the occupants of the side seats. This defect is of course less noticeable in the case of a music hall, but most auditoriums are called upon to serve a variety of purposes and must be designed for speaking, or at any rate singing, as well as for instrumental music.

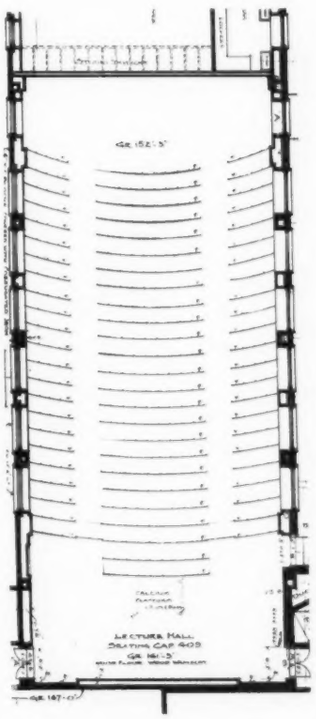


FIG. XLV.

Elliptical shapes are to be avoided in auditoriums of any size because they have a tendency to concentrate the sound in the vicinity of the foci to the detriment of other points. The effect is particularly accentuated where both floor and ceiling are horizontal or where the ceiling is an ellipsoid of which the speaker may occupy a focus. Fig. 48 represents the plan of such an auditorium, the speaker being placed at the focus S and the hearer at the other focus A. As the radii vectores to any point make equal angles with the tangent, it follows that the path of any sound of the speaker's voice will be projected in such a line as S b A c S d A e S, etc. That is, the walls deflect every sound alternately through two vertical lines erected at S and A, and thus concentrate as much sound in the vicinity of the two foci as is scattered over the entire wall surface. The results are sometimes startling. In the old Mormon Temple at Salt Lake City such conditions produce a remarkable whispering gallery. In smaller auditoriums the effect is less pronounced, but is always disagreeable. A particularly unfortunate instance is the ordinary semi-circular lecture hall, Fig. 49. Here the center of the circle takes the place of both foci of the ellipse, and the unfortunate speaker, relegated to this location, finds himself literally pelted by the deflected sounds of his own voice. This type of auditorium has many other drawbacks. The rear wall is extended to a maximum involving a corresponding danger of sound interference, while the absence of side walls eliminates the deflections which can usually be counted upon as the best reinforcement of the direct sound. Moreover the number of sounds concentrated at any given point is so few as very largely to increase the chances of interrupted reverberation, and altogether the acoustic conditions, which are naturally so favorable in the open hemicycle, are completely vitiated by the addition of a roof.

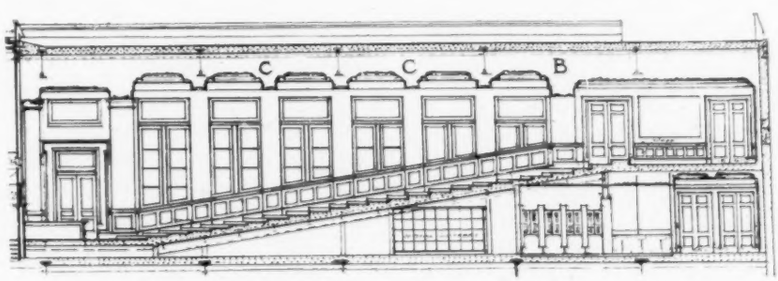


FIG. XLVI.

The best examples of a large auditorium designed in accordance with the suggestions of the preceding articles is the opera house of the Brooklyn Academy of Music. This auditorium is about 90 feet wide, over 100 feet deep on the balcony level, and averages 50 feet high in the clear. The volume is 432,000 cubic feet, exclusive of staircases and similar accessories; the seating capacity 2,200; the calculated reverberation 1.6 seconds; and the area of exposed woodwork about 7,500 square feet exclusive of the stage floor. Figs. 50 and 51 are reproduced from the working drawings of the main floor plan and longitudinal section, while Fig. 52 shows the general architectural treatment of proscenium and boxes. The megaphone surfaces were studied with scrupulous pains, and the result has been to develop a somewhat unique "center of distribution" extending from the middle of the footlights some 15 or 20 feet in either direction. The distribution of the sound is still satisfactory from points further back on the stage and also from the orchestra pit, but becomes defective in the vicinity of the first row of seats, as was demonstrated to much sorrow on one occasion when the stage was temporarily extended out into the auditorium. Of course this result is only what might naturally be expected, as the center of distribution, being necessarily of limited area, was carefully located under the proscenium arch where it would be of most service.

The rear of the house was designed with equal

attention to detail. As will be seen from the section, the first sound escaping above the gallery gods meets the ceiling before it can reach the rear wall. All sounds deflected from this portion of the rear wall are therefore forced to strike the carpet before they can return to cause sound interference. The first balcony is similarly protected by a high barrel vault, and the main floor by a series of arcades which were originally fitted with draperies above the impost. The distinctness resulting from these precautions is almost uncanny. On the occasion of certain semi-religious services, the benedictions whispered on the stage could be readily understood under the extreme rear of the second balcony at a distance of over 100 feet.

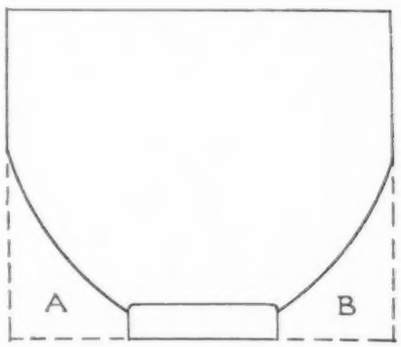


FIG. XLVII.

The calculations for timbre were based upon the conditions existing in the New Amsterdam Theatre. It must be admitted that, at the time, this procedure was to some extent an experiment, because although the theater had given satisfaction for both drama and vaudeville, its quality of tone had never been tested by serious music. The conditions at the Brooklyn Academy have, however, met every demand. All in all, the results obtained in this case are so precisely along the lines of the methods employed as to furnish a reasonable presumption in favor of the expedients advocated in these articles. They at least demonstrate the possibility of designing a large auditorium equally well adapted to every acoustic requirement.

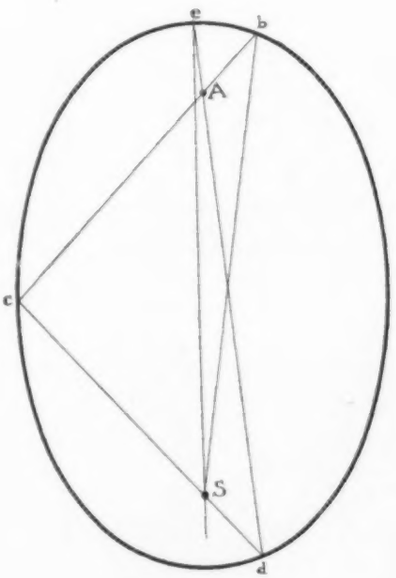


FIG. XLVIII.

CONCLUSION.

As stated at the outset, the object of these articles has been merely to suggest practical methods of getting at results. A certain amount of theory has of necessity found its way into the discussion by way of explanation, but no attempt has been made to develop anything in the nature of a scientific treatise. Before leaving the subject, however, one or two points of somewhat broader application may properly receive a passing notice, as indicating the direction in which a more complete analysis of the subject would be likely to lead.

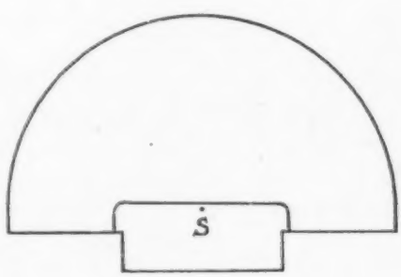


FIG. XLIX.

In the discussion of loudness no mention was made of the cumulative effect of reverberation. Evidently in the case of a loud and sustained note the reverberation produced by the beginning of the note is added to the total volume of sound toward the close. In an auditorium possessing a reverberation of upwards of 1.5 seconds, this increase or swell in the intensity of the sound is very perceptible. The phenomenon is perfectly familiar to powerful singers who depend upon it to accentuate and develop their most telling effects. A somewhat prolonged reverberation is therefore desirable in a hall devoted to music of a grandiose type. On the other hand the voice of the average vaudeville singer is not sufficient to derive any important support from accumulated reverberation, and as the words of a comic song must be readily understood, a much shorter reverberation is desirable for operetta.

In the discussion of distinctness the difficulties arising from interrupted reverberation were based upon an interval of $\frac{1}{15}$ of a second. This interval is very possibly too short, as the real cause of the difficulty may be due to the overlapping of one syllable upon the next, rather than to a repetition of sound. In rapid conversation the ordinary person pronounces about two hundred syllables a minute. Allowing for the pauses between phrases and sentences, and assuming that the consonants occupy about half of the remaining time, it can readily be shown that the vowel sounds average about $\frac{1}{10}$ of a second apiece, the shortest probably requiring no more than $\frac{1}{12}$ of a second. It is quite possible that interrupted reverberation should properly be based upon this interval of $\frac{1}{12}$ of a second rather than upon $\frac{1}{15}$ of a second. If this is the case the procedure recommended in the preceding articles, while a trifle too strict, really amounts to little more than allowing a slight factor of safety.

In the discussion of reverberation some mention was made of the influence of the shape of the auditorium. Probably with further investigation it will be found that

the constant 0.052 in the formula $(A+X)T=0.052V$ must be varied to correspond with the type of auditorium in question. When a sound is first produced it is, of course, concentrated in the vicinity of its source. Its spread in the form of a spherical wave can be readily followed and the surfaces upon which it will strike first and most sharply can be seen at a glance. Even after two or three deflections the general movement can still be traced by the graphical methods already described. Soon, however, the conditions become too complicated for detailed

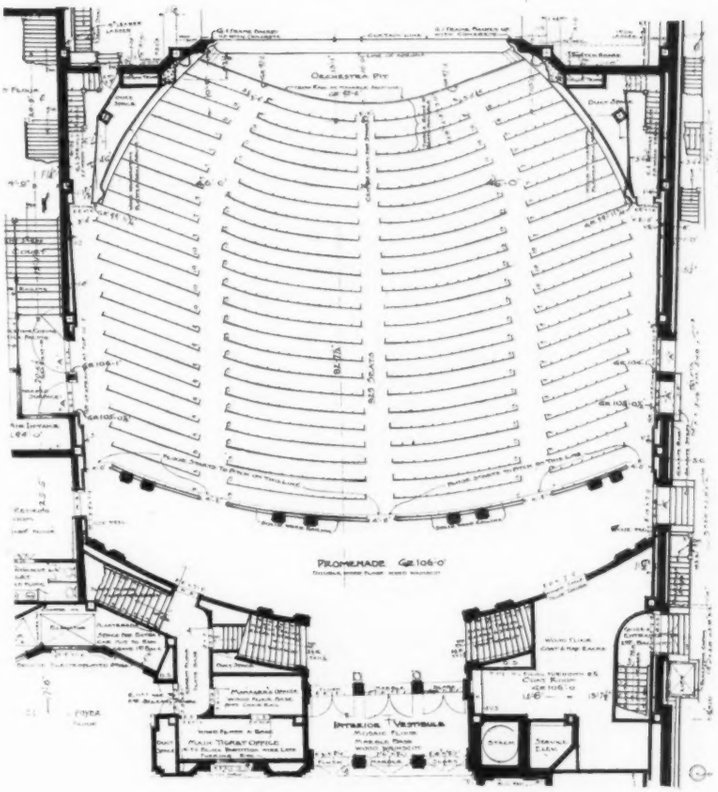


FIG. L.

comprehension, and after a space of time which rarely exceeds $\frac{1}{4}$ of a second, the expansion of the sound-wave and the multiplicity of its deflections result in dispersing the sound almost equally throughout every portion of the entire auditorium. During the period of initial distribution the location of the absorbents is of distinct importance. Subsequently it is entirely immaterial. This means merely that the tendency towards an equal distribution of sound is much greater than the possibilities of unequal absorption. It follows

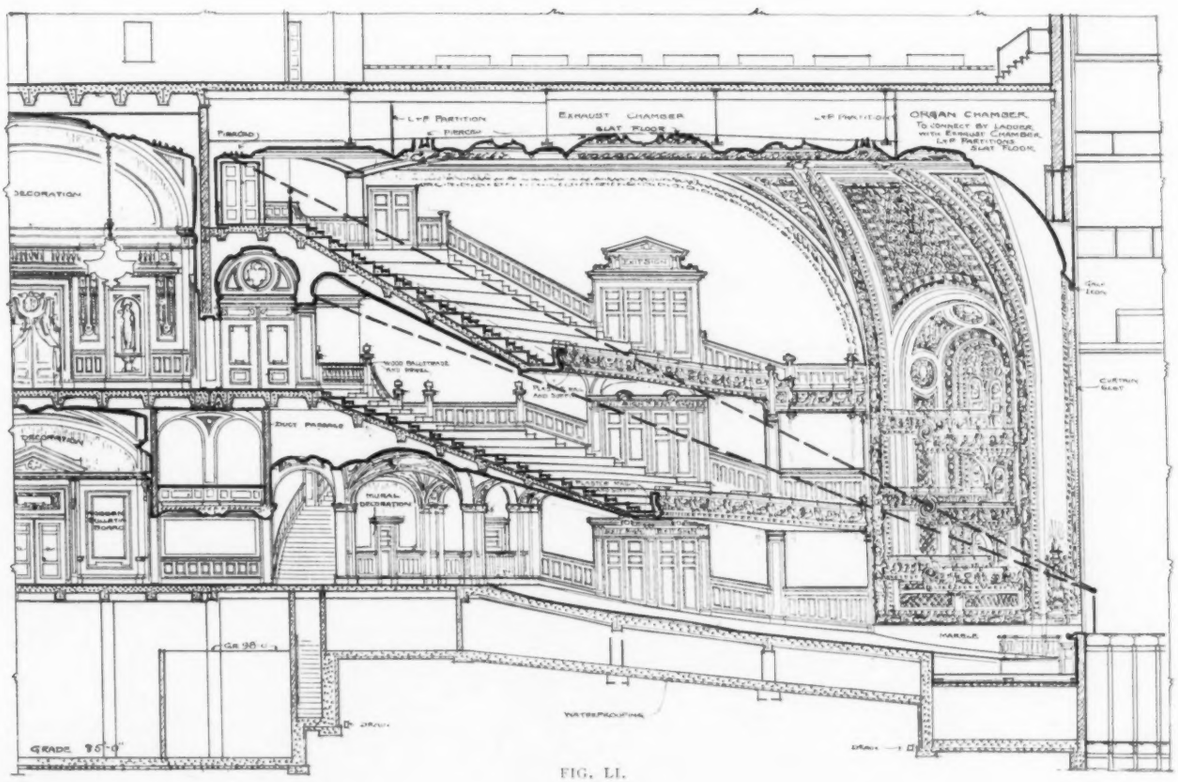


FIG. LI.

that the reverberation will remain audible for practically the same length of time in all parts of an auditorium, and after the first quarter of a second will die away at exactly the same rate no matter where the absorbents are placed.

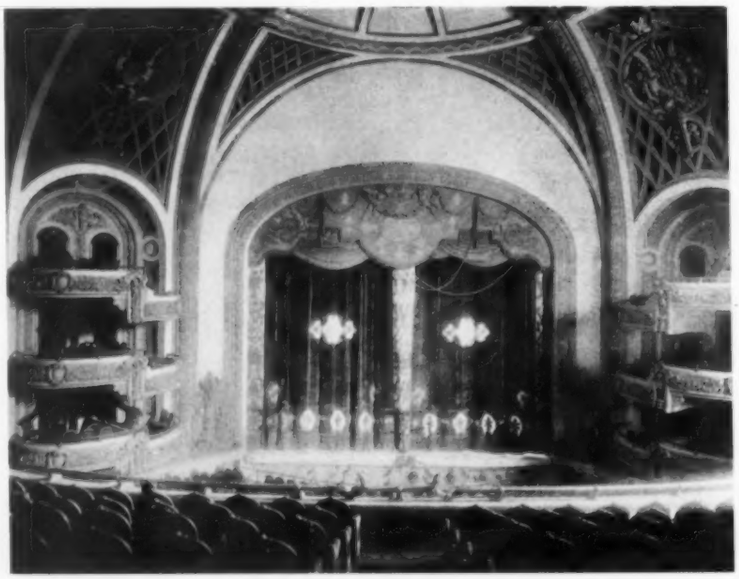


FIG. LII.

Under ordinary conditions, and in particular whenever the front of the auditorium is rectangular, the sound is absorbed at approximately the same rate during the initial distribution and during the subsequent period of audibility. In such cases the length of the reverberation can be accurately computed from the formula $(A+X)\,T = 0.052V$. Where, however, all sound is immediately concentrated upon an absorbing surface there is reason for believing that the reverberation is materially diminished. This is precisely what takes place in an auditorium of the megaphone type. Here every part of the sound-wave is almost immediately directed against the rear wall, where every possible contrivance has been prepared for its absorption. As will be seen by Fig. 53, unless the dimensions are extremely great, the longest sound-path S B C D A cannot be much over 100 feet longer than the direct path S A; so that if the rear wall were a perfect absorbent all sound would be destroyed within the first tenth of a second and there would be no reverberation worth mentioning. Of course in practice some little sound is necessarily deflected from the balcony fronts, some from the rear wall surfaces, and a trifle from even the audience, but the total amount is so small that it seems probable that in a megaphone shaped auditorium the reverberation is materially less than calculation based on the coefficient 0.052 would indicate. If this is the fact, it would indicate that where the sound is carefully distributed throughout an auditorium, an actual reverberation of even less than 1.6 seconds will give satisfactory musical quality in an auditorium of 400,000 cubic feet.

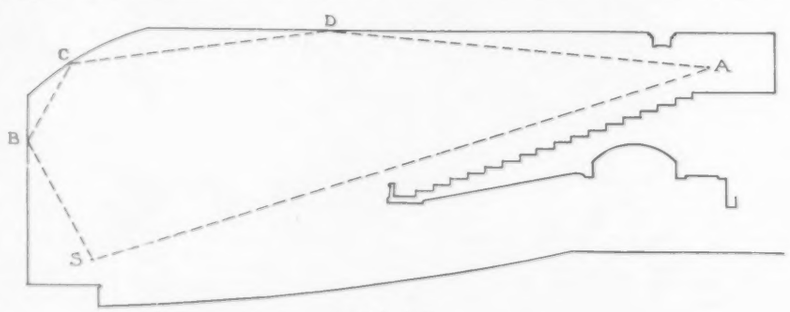


FIG. LIII.

Another phenomenon which has not yet been carefully investigated is the relative effect of reverberation in different parts of the same auditorium. As just explained the duration of reverberation is everywhere the same. On the other hand the initial intensity varies enormously with proximity to the speaker. Evidently the relation of reverberation to initial intensity varies correspondingly in different parts of the same auditorium, the reverberation being relatively greatest where the intensity is least. Nevertheless in auditoriums where the reverberation is insufficient, the defect often seems most accentuated where the sound is faintest. This would seem to indicate that the ear accepts volume of sound to some extent as a substitute for quality. If this inference is correct it may explain the large amount of reverberation required to give quality of tone in a large auditorium, particularly at points where, owing to the great distance between musicians and audience, the intensity of the sound is relatively small. These and other similar speculations will doubtless lead in time to conclusions of much practical value. In the meantime, it is hoped that the suggestions which have been offered may prove of service, at least to the extent of obviating the most serious of the acoustic defects which are to be met with in so many of our finest buildings. Even if nothing further is accomplished, a long-suffering public has become so thoroughly inured to the worst of acoustic conditions that scant mediocrity is apt to be hailed as a triumph.

Authorities cited in the preceding articles:
Barker, "Physics," Advanced Course.
"Encyclopædia Britannica," Vol. XXIII., pages 222 and 223.
Rice, "What is Music?"
Sabine, "Architectural Acoustics."
Vitruvius, V. 4 and 5.
The reader is also referred to "The Theory of Sound in its Relation to Music," by Professor Pietro Blaserna.

Burnt Clay's Share in the Rebuilding of San Francisco.

III. Public and Semi-Public Buildings.

BY WILLIAM C. HAYS.

IF MY two previous papers were devoted entirely to private or business enterprises, it is not to be inferred that public work was being neglected. The city faced a serious situation for there were miles of streets to repave, and sewers and other service installations to be repaired or in most cases rebuilt. Car tracks and conduits too had to be relaid by the public service corporations, so that work was held back in the re-grading and re-surfacing of streets.

But there was not much delay in planning for the new municipal buildings. A new clean city government had come to take the place of an old and, apparently, corrupt one. At its head was Edward Robeson Taylor, Dean of the Hastings College of Law, of the University of California. And with him there served two able and distinguished men in the office of city architect. This municipal work, then, was in good hands during the administration of Newton J. Tharp and after Tharp's death, of Loring P. Rixford. Both of these trained men put at the command of the city loyal, efficient service, and designed buildings second to none in America for their purposes. But history repeats itself; as in Boston and Chicago, so it has been in San Francisco — and so it perhaps always will be while Boards of Works have unlimited authority over city architects. The man of ability and integrity is sooner or later bound to clash with ignorance and too often with less excusable faults. Mr. Rixford disagreed with the Board of Works and soon, it seems, the city architect's office fell into devious ways, so that it became less than a negligible institution. It needs desperate remedies, perhaps an emetic.

DETAIL, HANCOCK GRAMMAR SCHOOL.
Newton J. Tharp and Loring P. Rixford, City Architects.

The most urgent of the municipal buildings were the schoolhouses, fire stations and hospitals, and the city architect's office, in its palmy days, did noteworthy examples of all classes. The school which is most striking in plan and scheme is built of concrete, and being therefore frowned upon by an intolerant "brick-and-terra-cotta" editor, the school is dismissed. But those which are most interesting in execution — the Hancock and the Mission Grammar Schools, are both burnt clay jobs as are the Washington and the (unfinished) Denman School, while the Sutro and McCoppin are composite construction, the lower story in each being brick.

The Hancock School was planned during Mr. Tharp's administration as city architect and executed under Mr. Rixford. In the exuberant quality of the ornate terra cotta balconies, and in the composition of its rich cornice and pierced parapet there is admirable detail. The walls are selected common red bricks, of deep color, rich in variety. A fine study in simple straight line pattern is seen framing the grouped and mullioned windows of the class rooms. The terra cotta is buff, standard finish. This school is on a steep sloping street and has an uncommon arrangement of approach, by a long bridge from sidewalk to main entrance, crossing over part of the play yard, the yard being reached directly from the sidewalk on the downhill end of the lot.

The Mission Grammar School was started during the incumbency of Mr. Tharp, whose sudden death occurred soon after the building was begun. It is of light gray brick, with terra cotta trimmings to match. Unlike all the other new schoolhouses in the city, it has a low mansard roof.

Several fire stations have been constructed, of which two are within our province. They are the house for Truck No. 10 on Sacramento street near Walnut and that of Engine No. 41 on Leavenworth street between Clay and Washington. The former is uninspiring; it is as stupid as the latter is engaging and naive. I do not know a more perplexing little façade than this — shouting defiance at canons of design, it is bad in proportions (for the demands of lot width and story height seem to have made it so). But a clever hand has given to it wall

texture, color, and craftsmanship so beautiful, added to an effect of light and shadow so well studied, that one does not think of proportion until he is so biased that his principles are waived. Like many of the old things abroad, violating half the supposed "rules" of composition, the result may be the masterpiece.

MISSION GRAMMAR SCHOOL.
Newton J. Tharp and Loring P. Rixford, City Architects.

Mr. Rixford, I believe, carried out this charming little front. He must have had the hearty co-operation of terra cotta and tile makers and setters. The bricks are moderately rough, wire cut, of a considerable range of color; the terra cotta is slightly lighter, while the diaper pattern filling the gable over the windows, and the accents under the cornice, are varied from intense greenish blues, through shades of purples, browns and reds. This station, like the Sacramento street building, is the last word in fire-house construction and equipment.

The Municipal Hospital, unfortunately, is not far enough advanced in construction to be photographed — nor is the Denman School, both of which give promise of being successful, if their execution is put under capable sympathetic hands. These are both to be studies in brick, terra cotta and tiles with, I understand, a generous use of colored inlays.

The mention of Tharp's and Rixford's Municipal Hospital plans brings me to express regret that the Children's Hospital (by Bliss & Faville) is not further advanced. There is a stunning main entrance, which will be back under an arcade, after the façade is all up. Here, as in the Newhall Building of Hobart's, we find sculpture — not merely modeling. The same feeling that marks Mora's other work is here, especially in the tympanum over the door: there is a calling up in the mind of the day when one stood in humility before his first real Della Robbia. This entrance is the most successful polychrome yet made; it marks the Coast's present state of advancement in a new-old art which must surely count for much in the architecture of the future. In addition to the entrance there will be glazed and polychrome terra cotta in the belt courses and cornice of this new hospital — and the walls are of specially made wire-cut bricks, very rough, with a full range of color in the light clays.

ENGINE HOUSE NO. 41.
Loring P. Rixford, City Architect.

Meanwhile additions are being, or have been, made to the German and some of the other hospitals, and several entirely new ones are contemplated or under way. Brick and terra cotta are important factors in the construction and decoration of these buildings.

San Francisco — the (so the "Union Labor" Mayor McCarthy calls it) "Paris of America" — could never have contented itself long with merely serious matters, like business buildings, houses and hotels, schools and hospitals. Cafés, restaurants, theaters, clubs — these had almost all been wiped out — but had not long to wait their turn for restoration in the city's gay life.

Of the clubs, all but the

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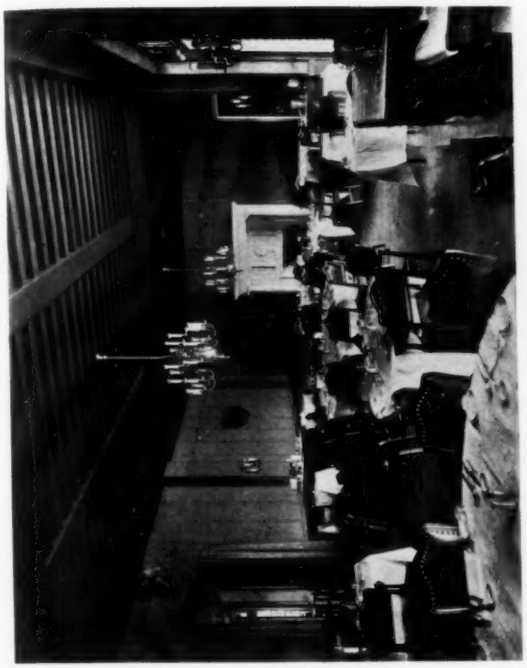
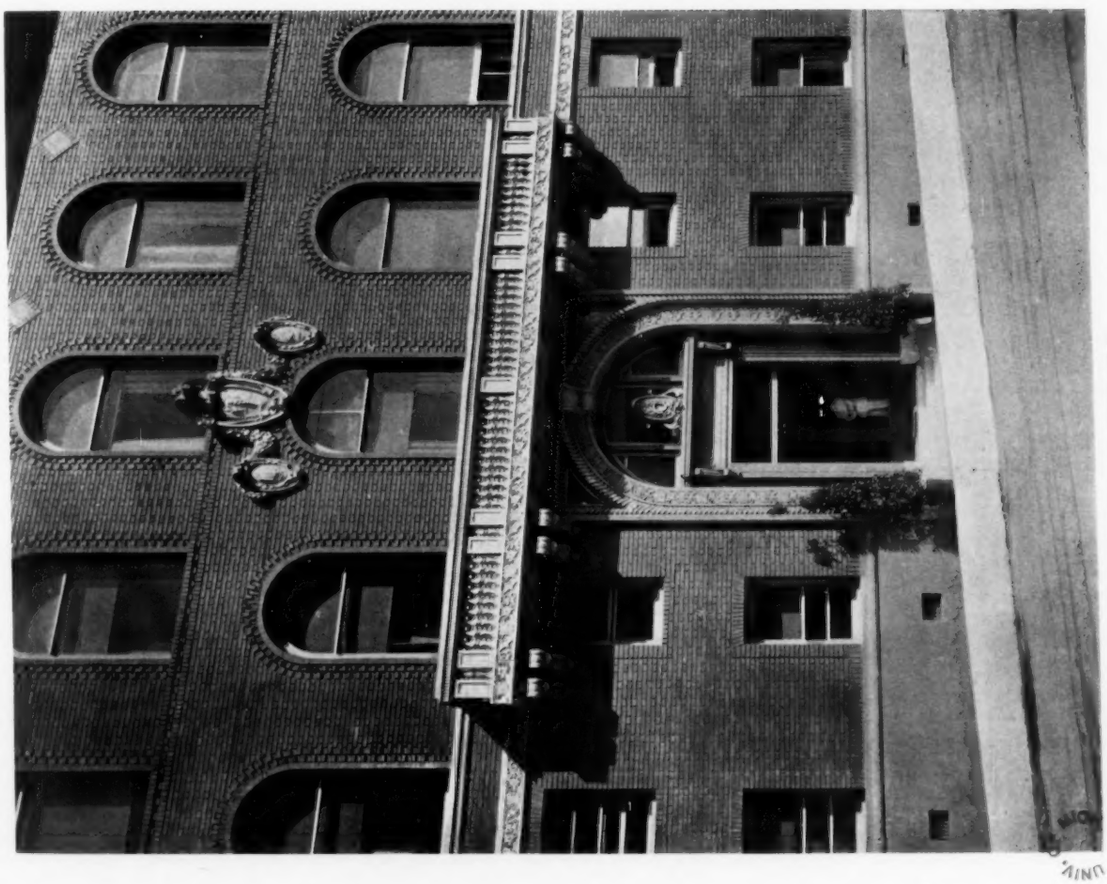


DINING ROOM.

LOUNGING ROOM.



DETAIL OF ENTRANCE.

UNIVERSITY CLUB, SAN FRANCISCO, CAL.
Bliss & Faville, Architects.

INTERIOR OF FOYER.

DETAIL OF ENTRANCES.

THE PROSCENIUM.

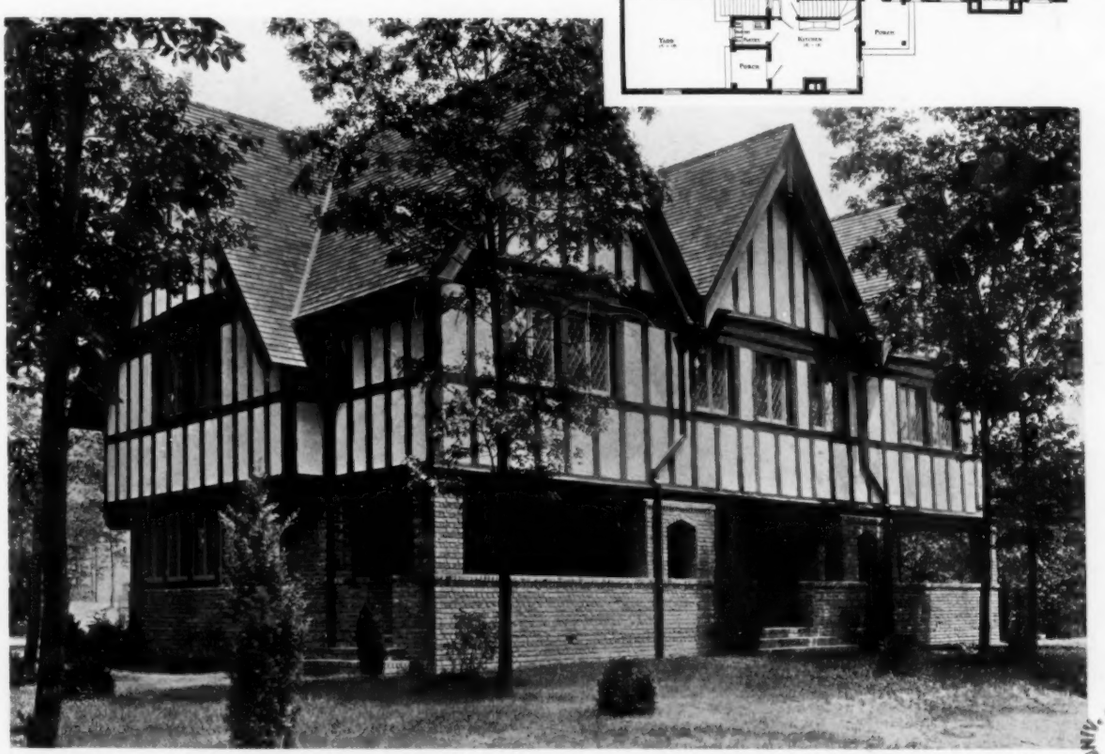
COLUMBIA THEATRE, SAN FRANCISCO, CAL.
Bliss & Faville, Architects.

SECOND FLOOR.

HOUSE AT BELLE TERRE, LONG ISLAND, N. Y.

Frederick Junius Sterner, Architect.

FIRST FLOOR.

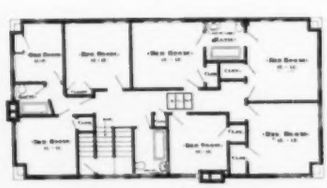


HOUSE AT BELLE TERRE,

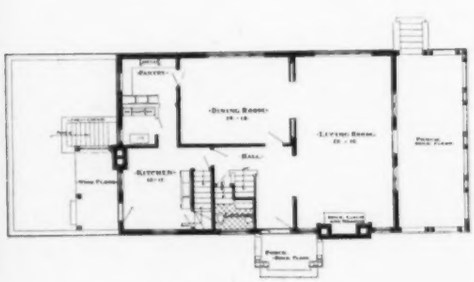
LONG ISLAND, N. Y.

Frederick Junius Sterner,

Architect.



SECOND FLOOR PLAN.



FIRST FLOOR PLAN.

HOUSE AT BELLE TERRE,

LONG ISLAND, N. Y.

Frederick Junius Sterner,
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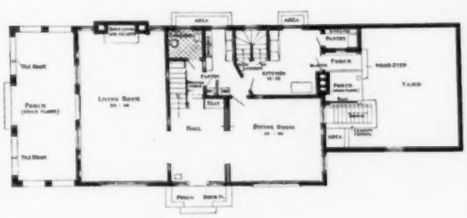
SECOND FLOOR PLAN.



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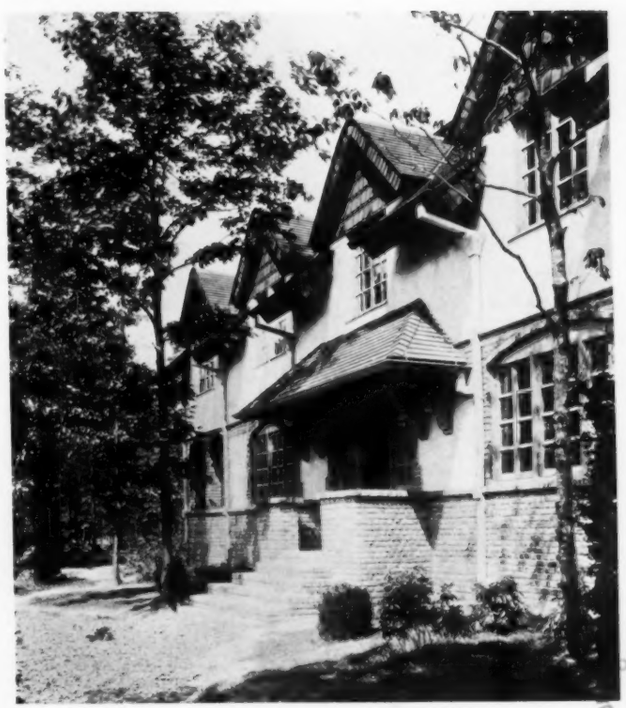

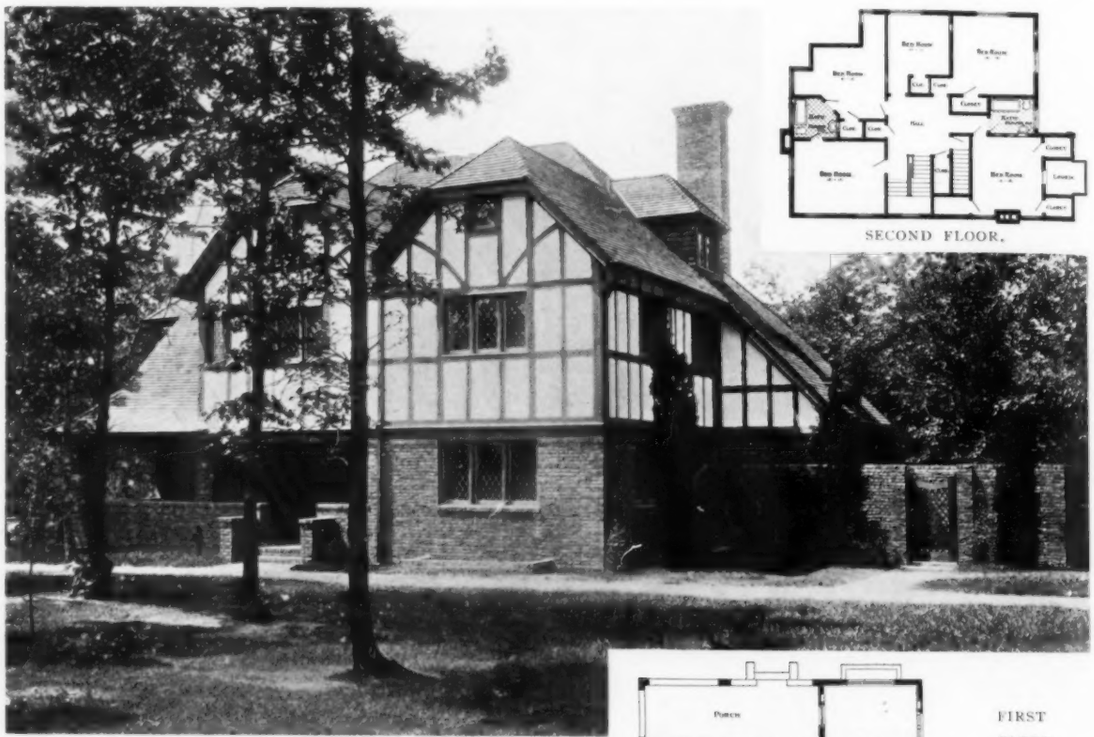

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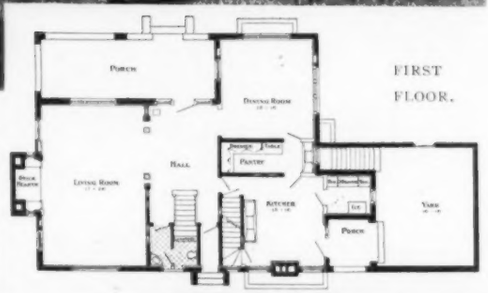
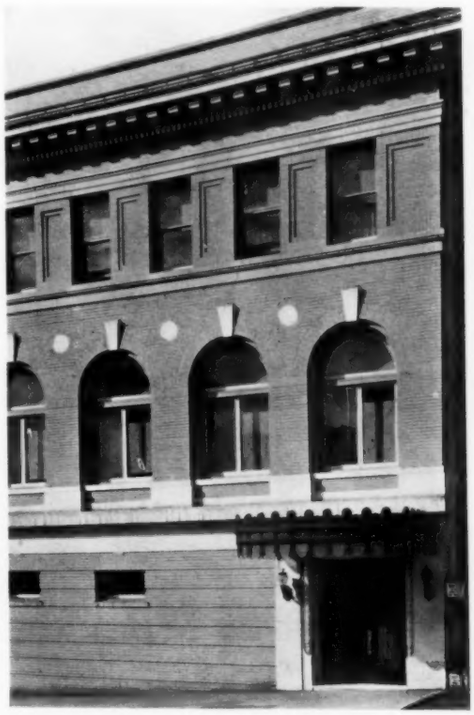


FIRST FLOOR.

HOUSE AT BELLE TERRE, LONG ISLAND, N. Y.

Frederick Junius Sterner, Architect.

Cosmos and the Women's "Century" found themselves homeless. That condition did not last very long; some are already in their new homes. The Pacific Union Club will soon take possession of superb quarters up on Nob Hill, opposite the west front of the Fairmont Hotel. There the red sandstone shell of the old Flood Mansion has been restored and extended by D. H. Burnham & Co under the personal care of Willis Polk; it is to have an interior such as to class it among the best club buildings in this country. But those clubs, building entirely new houses, have all elected brick and terra cotta for theirs and many of these are already occupied.



ENTRANCE TO THE ARGONAUT CLUB.
Sylvain Schnaittacher, Architect.

Let us defer to the ladies: they were the first, and down on Union Square is the trim little building of the "Town and Country," convenient to the shopping district, for a resting place of the women who are its members. It is of red brick with white marble trimmings; on the ground floor is a bookshop and, taking it all in all, it is Walnut street transplanted, and means homesickness, surely, for the passing easterner.

Diagonally across the square, at the corner of Powell and Post streets, is the Argonaut Club, by Sylvain Schnaittacher, and not far off is Dutton's Union League Club; somewhat alike these are in general scheme, both having stores in the ground floor with the club quarters above. On Post street too, are the most famous of all San Francisco clubs, the Bohemian and Olympic. The latter is still a hole in the ground, but it is expected that a handsome brick and terra cotta building will be going up soon, from the plans of Paff & Baur.

The Bohemian, on the other hand, is nearing completion — and will be occupied before the end of the year. It was originally planned by Loring Rixford, who, on becoming city architect, asked Geo. W. Kelham to succeed him in carrying out the clubhouse scheme. The Bohemian is built of selected common red bricks with red terra cotta balconies, entrances, balustrades, belt courses and cornice; below the main cornice is a range of well studied panels of brick pattern. The house fronts on a steep sloping street and is unfortunately awkward in mass, seen from the upper end — an unavoidable defect due to the site, but atoned for by the nice proportion of the south front. The distinguishing feature of this house is its own theater — a very complete one, too — which no one who has ever visited San Francisco need be told is the "Jink's Room." Long before I had ever seen California a young Englishman (en route from San Francisco, home) lunched at the T Square Club, and discussed the Bohemians, who, so he told us, have "their Summer Jinks and Winter Jinks; their High Jinks and Low Jinks — and my word! the low jinks are very low indeed!" That was slanderous of the "low jinks," and of the others! there is perhaps no performance in America so memorable as the yearly "Summer Jinks," given out-of-doors among the fire-lit towering redwoods up in Bohemian Grove.

ENTRANCE TO THE FAMILY CLUB.
C. A. Meussdorffer, Architect.

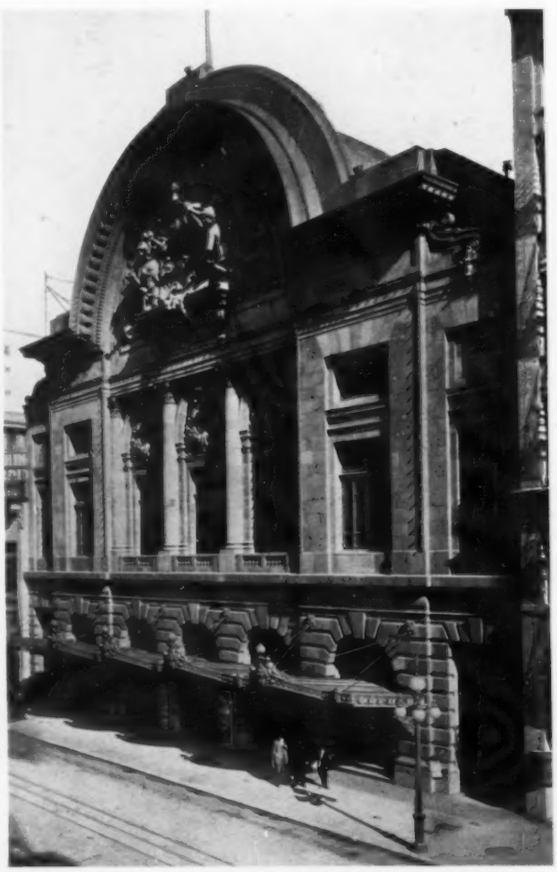
It is a fine house to which the Bohemians are now planning an early home-coming. And this club, in conjunction with his other work at the Palace Hotel, justifies the grouping of Mr. Kelham with Mr. Hobart as happy acquisitions to the local architectural ranks, recruited as the direct result of the great fire.

Two other leading clubs are already in their

permanent quarters. The "Family" stork is perched at Powell and Bush streets, where Mr. Meussdorffer has housed him and his legion progeny in the only pressed brick clubhouse in the city; it is trimmed with terra cotta and moulded cement.

The University Club fits! It fits its site; it suits the climate; it looks "The University Club." Totally unlike McKim's masterpiece on Fifth avenue, this building on Nob Hill has some evasive quality of the New York University Club that yet brings them into mind together. No other clubhouse here has the dignity of this mass, notwithstanding two are larger and much more expensive. Here, though one feels that the designers have freed themselves from the McKim influence, "M(i)ckimeni" they are no longer. (The term echoes from far-away Florence, from Edwin Dodge, some time of *l'ecole des Beaux Arts*, later of Boston, now of his "Sabine Farm.") In the eastern front Bliss & Faville have frankly thrown precedent to the dogs; those great voids are revolutionary. But from their plate glass windows and balconies spreads out a view of much beauty, looking over the roof tops of Chinatown and the lower city — across blue waters to the trans-bay cities and the Berkeley Hills.

From this very successful work of Bliss & Faville it is but a short distance down the hill, past their St. Francis Hotel, to that *tour-de-force*, the Columbia Theatre. The building is divided into two parts, the greater on Geary street, being the theater itself; the smaller wing, leading to Mason street, containing dressing rooms and the general service quarters for the stage.



ORPHEUM THEATRE.
G. Albert Lansburgh, Architect.

The distinguishing feature of the Columbia is, of course, its polychrome façade. Both the brickwork and the terra cotta are alive in color — the bricks in warm buffs, the terra cotta in several buffs, browns, purples and blues. The soffits of cornice and upper belt course are most intense ultramarine — and the same color appears as background for the frieze above the Palladian arches as well as on the bells of the Corinthian capitals. The greatest color range is found, naturally, in the fruit and flower ornamentation of the smaller columns. The total suppression, by the way, of all constructive form in these columns, is a daring innovation that has caused some unfavorable criticism and not without a basis of reason. But whether one finds minor faults or not, the Columbia is a long, long advance over anything I know in theater design in the west — and it has served to point out the almost unlimited possibilities of this material whose uses we are beginning to rediscover after a lapse of five centuries.

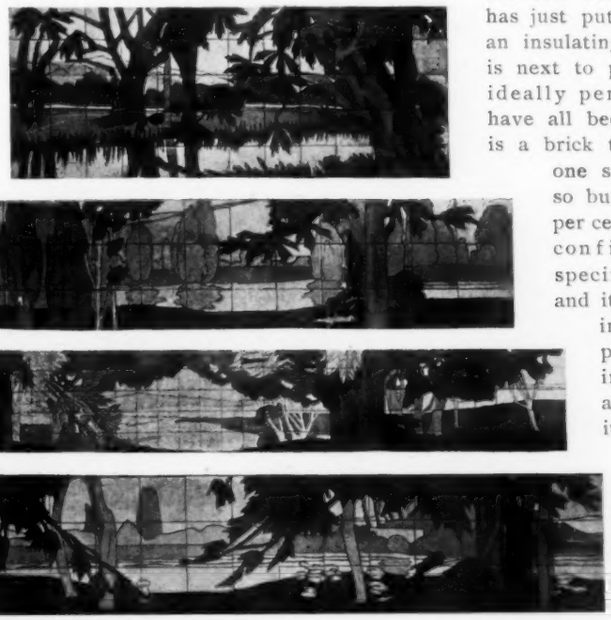
The interior is direct in parti and successful in its carrying out; here, again, the loss of color in photography means the failure of the illustrations to really illustrate, for the interior decoration is admirable. As to conditions of sight and sound the building is ideal.

Of the other permanent theaters in San Francisco little can be said, excepting of two, and one of these is not typically a theater. In John Galen Howard's theater for the Claus Spreckels Estate the Market street frontage is almost completely taken up with small shops, having all-glass fronts. The theater entrance alone is on this front, the auditorium itself being behind on a rear street. The white glazed terra cotta piers with their entablature are, however, exceptionally good examples of work in modeling, making and setting — it is one of the best in San Francisco. And in design this is all frankly terra cotta — which is not the case in Lansburgh & Joseph's "Orpheum" façade. The Orpheum, a cut-stone design, is executed in so clever an imitation of Colusa sandstone that one can hardly tell the real from counterfeit. It should be remembered, apropos of design, that this building is not to be judged by quite the same standards as is the more "legitimate" Columbia; it is frankly a vaudeville house. It was done, too, by a man of Gallic temperament — fresh from his studies in Paris: one fretting under the conventional — who deliberately set about producing the uncommon. If the composition has discrepancies in scale, it does not lack vigor. In a later work of Lansburgh's, the Elkan Gunst building referred to in my first article, he seems to have designed, in terra cotta, forms for execution in near-granite; his next step should bring him to a terra cotta design in honest unabashed burnt clay. And, after all is said, that is the besetting weakness of the bulk of the new work here — the failure to design terra cotta in its own forms, and, in lesser degree, to execute it undisguised. Perhaps these faults are not merely local in San Francisco.

Editorial Comment and Miscellany.

HOUSES AT BELLE TERRE, LONG ISLAND, N. Y.

A SECTION of the large estate known as Belle Terre, situated on Long Island, adjoining the village of Port Jefferson, is being improved with country houses costing from $12,000 to $15,000. The entire work of developing this estate in a practical and artistic manner has been entrusted to Frederick Junius Sterner, architect. In this issue of THE BRICKBUILDER are shown seven of these houses already finished, some of which are on the lines of the manor houses of England, while others have a more modern English treatment. Particular attention has been given to the materials used, so that not only has the form been preserved, but the color and texture of the brick, wood, plaster and other materials entering into the construction of these houses have been carefully considered. The gardens and as much garden wall, seats, dials, etc., as it was possible to introduce with the small amount of money expended have been arranged so as to bring into perfect harmony the buildings with their surrounding landscape. The fundamental principle upon which these houses were built was the use of more or less crude materials employed in a careful and workmanlike manner by skilled workmen who have taken a personal interest in the result of their efforts.



PANELS IN WALLS OF DINING ROOM, LINCOLN PARK REFECTORY, CHICAGO.
These panels were executed in colored faience by the Rookwood Pottery Company. In combination with Ironclay brick the walls are extremely rich in color and texture.
Perkins & Hamilton, Architects.

CARTOUCHE, CAPITOL CITY CLUB, ATLANTA.
Executed by Atlanta Terra Cotta Company.
Donn Barber, Architect.

A BRICK THAT FLOATS!

IN BUILDING cold storage warehouses, some parts of breweries, chemical laboratories and many other buildings where a low temperature must be maintained or where absolute freedom from dampness is necessary, the walls have to be insulated, and while the ordinary materials, brick, stone or concrete are used for structural purposes, there has also to be a lining of cork, hair felt, flax fiber, charcoal, sawdust or some other more or less imperfect insulation. Most of these materials disintegrate, rot, become foul and last but a little while.

The National Fire Proofing Company has long experimented with insulations and has just put upon the market an insulating lining brick that is next to perfect, if not the ideally perfect material we have all been hoping for. It is a brick to all intents, but one so waterproofed and so burned that forty-five per cent of the volume is confined air and its specific gravity is 0.90 and its ultimate strength in compression 750 pounds per square inch. It floats, it absorbs no moisture, it is everlasting, can be used and put into the wall in the one operation of building, for it can carry a very considerable load. It is a notable and long needed contribution to the building art. The National Company calls it terra cotta cork or insulating building blocks.

CEILINGS OF PENNSYLVANIA RAILWAY STATION, NEW YORK CITY.

THE concourse ceilings of America's greatest railway terminal, the Pennsylvania at New York, McKim, Mead & White, architects, of which we illustrate a small portion of the arcade, are another example

DETAIL FOR SOUTHERN BUILDING, WASHINGTON.
Executed in terra cotta by Atlantic Terra Cotta Company.
D. H. Burnham & Co., Architects.

of Guastavino construction. The adaptation of the vaulting in continuation with the ornamental steel work is one of the interesting features of this building. The ceilings have a white glaze surface.

DURABILITY OF STEEL CONSTRUCTION.

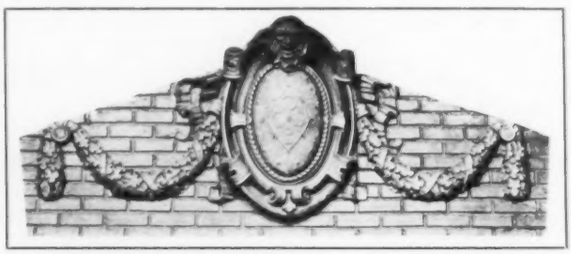
MR. F. J. T. STEWART, superintendent of the Board of Surveys of the New York Board of Firewriters, has furnished some interesting data in regard to the effect of time on the steel skeletons of skyscrapers. The observations were made during the demolition of the Gillender Building, New York City, and at the Ames Bolt Works in Jersey City while the columns and parts of the structure were being dismembered. The inspection of the steel work indicated that the buildings were in practically as good condition as at the time when they were erected. Some evidence of corrosion with slight pitting was observed, apparently due to defective column covering which permitted dampness and other atmospheric conditions to penetrate to the steel work. The examination tends to show that a covering of cement mortar protects steel from corrosive influence better than any form of paint, and that it is important to paint the steel both at the mill and after being erected at the building before the cement coating is applied.

DETAIL OF GARDEN AT MORRISTOWN, N. J.
Ferruccio Vitale, Landscape Architect.

PALACE OF THE POPES, AVIGNON.

CONSIDERABLE interest is being manifested over the successful restoration of the Papal Palace at Avignon, France. During the different epochs the interior of this monumental work was changed and much of its architectural beauty ruthlessly destroyed. In the pontifical chapel the original windows were bricked up while ordinary windows were cut through the solid walls irrespective of the general appearance. The walls of the structure were lime-washed at least twice a year and staircases with no dignity or style were built throughout. By accident the frescoes of former ages were discovered, and the Commission of Historic Monuments entrusted the task of renovation to M. Yperman of Bruges. As a result fresco paintings consisting of six separate themes have been preserved, including some remarkable examples of the fourteenth century.

DETAIL BY THE NEW JERSEY TERRA COTTA COMPANY.
Warren & Wetmore, Architects.



DETAIL BY SOUTH AMBOY TERRA COTTA COMPANY.
York & Sawyer, Architects.

CEILING PANEL IN MAIN LOGGIA, STATE EDUCATIONAL BUILDING, ALBANY, N. Y.
Executed in white, cream and light blue terra cotta by Atlantic Terra Cotta Company.
Palmer & Hornbostel, Architects.

A monumental door, highly executed, has also been discovered along with other architectural features which evidence the skilful work of former French artists.

PANAMA-CALIFORNIA EXPOSITION.

JOHN C. OLMSTED of Olmsted Bros., architects, is in San Diego, California, under contract to the Panama-California Exposition to design the general character of the permanent buildings of the exposition and to advise regarding the landscape features of Balboa Park, which is to be the site of the exposition. The improvement of Balboa Park is preliminary to the Panama-California Exposition, to be held in San Diego in 1915, ostensibly in commemoration of the completion of the Panama Canal, but practically as a means of exploiting the resources and opportunities of the Southwest, Mexico, Central and South America. The first buildings to be erected under the supervision of Mr. Olmsted will be an auditorium, an arts building, a modified Greek theater and a stadium. These with their gardens, courts and grounds will occupy about 100 acres, and will form the nucleus for the further improvement of the park, which contains 1,400 acres of land admirably fitted for park purposes.

CONCOURSE OF PENNSYLVANIA RAILWAY STATION, NEW YORK CITY.
Vaulted ceiling of Guastavino construction.
McKim, Mead & White, Architects.

MOVING A CHURCH TOWER.

THE remarkable feat of moving a church tower in order to enlarge the original structure is being accomplished at Bocholt, Belgium. The work is under the supervision of two American engineers and the vast undertaking occupies only eight workmen. New foundations have been prepared for the tower some 30 feet away, to which machinery has been constructed for its transport. The tower dates from the fourteenth century and weighs approximately 3,000 tons. The tower was raised by the insertion of a movable platform over steel cylinders which in turn move along a railway line. During the first six days the tower was moved 64 inches. The remarkable success attached to this endeavor has led the engineers to propose a similar method to the Italian Government for removing and placing new foundations under the Tower of Pisa.

AUTOMOBILE SALES BUILDING, CHICAGO.
Cream enameled terra cotta trimmings made by the Northwestern Terra Cotta Company.
Holabird & Roche, Architects.

BRONZE DOORS FOR CAPITOL.

THE doors for the Western Entrances of the National Building at Washington have now been completed and are to be

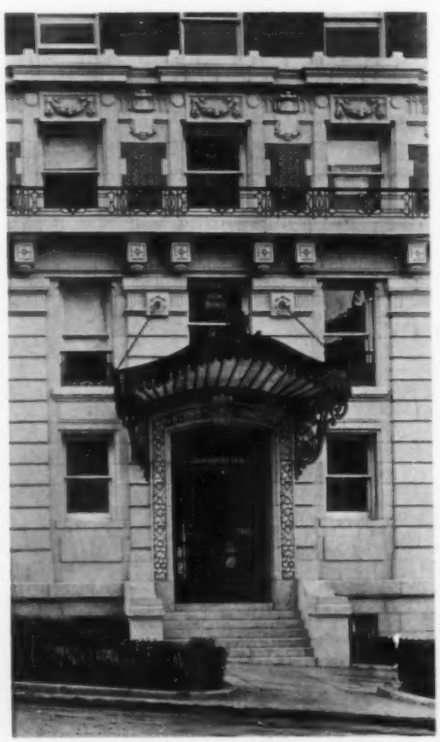
DETAIL OF HOTEL, BALTIMORE.
By Conkling-Armstrong Terra Cotta Company.
Joseph E. Sperry, Architect.

placed on public view in the Corcoran Gallery of Art. They are cast in bronze and are the work of L. Amatois, the artist, whose design was declared by the board of judges to be the most meritorious. The doors designed by Amatois represent the apothesis of America and contain designs which bring the history of the nation down to the present time. The panel in the transom of the doors shows an allegorical figure representing America seated in a chariot and drawn by lions led by a child, symbolical of the superiority of the intellect over brute force. Following the chariot are figures representing education, architecture, literature, painting, music, sculpture, mining, commerce, and industry. On one side of the transom is a statuette of Thomas Jefferson, and on the other side Benjamin Franklin. The medallions at the corners represent Peabody the educator philanthropist; Emerson the sage, philosopher and thinker; Horace Mann the educator, and Johns Hopkins the merchant philanthropist. Below the transom are eight panels in relief, four on each side. These panels depict allegorical representations of jurisprudence, science, art, mining, agriculture, electricity, engineering, naval architecture, and commerce. On the sides are statuettes of famous Americans.

BELNORD APARTMENT BUILDING, BROADWAY, NEW YORK CITY.
Exterior and courts of light gray Kittanning brick, furnished by Pfotenhauer-Nesbit Company.
Hiss & Weeks, Architects.

SKYSCRAPER LIMIT IN CHICAGO.

THE City Council of Chicago has decided that 200 feet will be the maximum height of buildings hereafter in that city. The present building code limits the height to 260 feet. The new provision will go into effect July 1, 1911, but the council has agreed to give those who have planned to erect skyscrapers in the down-town district a longer respite.



ENTRANCE TO AN APARTMENT, NEW YORK CITY.
Architectural terra cotta made by New York Architectural Terra Cotta Company.
Schwartz & Gross, Architects.

FIRE PROTECTION CONFERENCE.

A CONFERENCE on fire protection and equipment of buildings and cities was held in Philadelphia under the auspices of the local chapter of the A.I.A. Representatives were present from the telephone and insurance companies, the Engineers' Club, the T Square Club and the fire companies. Mr. H. P. Onyx, representing the insurance companies, dwelt upon the point that there will never be a curtailment of the enormous fire losses in our country until the subject of fire prevention and protection has received the same consideration by the general public that has been given to the stamping out of contagious diseases.

IN GENERAL.

The Architectural League of New York City announces the following competitions for the season 1910–1911: A prize of $50 for a Mural Fountain to be treated architecturally with sculpture and mosaics, together with a special prize of $300 for the best design submitted by an architect, sculptor and mural painter in collaboration.

The twenty-sixth annual exhibition of the Architectural League of New York City will be held in the building of the American Fine Arts Society, 215 W. 57th street, from January 29th to February 18th inclusive. The league reception will take place Saturday, January 28th, from 3 to 6 P.M. Public lectures will be given on Wednesdays, February 1st, 8th and 15th.

It is to be hoped that all members of the A.I.A. will attend the next annual convention of the American Institute of Architects which will be held in San Francisco, Cal., on the 17th, 18th and 19th of January, 1911.

The Cleveland Chapter of the A.I.A. and the Cleveland Architectural Club will hold theirannualexhibition in the Engineers' Building, Cleveland, from December 19th to the 31st, 1910.

The Atlantic Terra Cotta Company will furnish terra cotta for the Knickerbocker Trust Company, New York City, McKim, Mead & White, architects; polychrome terra cotta for the Hartman Theatre and Office Building, Columbus, O., Richards, McCarty & Bulford, architects; polychrome terra cotta for the Vanderbilt Hotel, New York City, Warren & Wetmore, architects; terra cotta for the Savannah Bank & Trust Company, Savannah, Ga., Mowbray & Uffinger, architects.

HOUSE AT CLEVELAND, OHIO.
Roofed with combination shingle tile made by Ludowici-Celadon Company.
Watterson & Schneider, Architects.

The architectural firm of Warren & Welton, Birmingham, Ala., has been dissolved. Mr. William Leslie Welton of the above mentioned firm will continue the practice of architecture at 1209 Empire Building. Manufacturers' catalogues and samples solicited.

The dark red stain furnished by Samuel Cabot, Inc., is being used in Buffalo with marked success in making the new brick of additions to buildings similar in appearance to the brick in the old parts.

W. D. Richardson, one of the best known experts on clay manufacture in this country, has been appointed general manager of the brick manufacturing business of the Ohio Mining & Manufacturing Co., at Shawnee, Ohio.

"Tapestry" brick, furnished by Fiske & Company, Inc., was used in the garden at Morristown, a detail of which is shown in this number of THE BRICKBUILDER.

TREASURY DEPARTMENT, Office of the Supervising Architect, Washington, D. C., Nov. 26, 1910.

SEALED PROPOSALS will be received at this office until 3 o'clock P.M. on the 14th day of January, 1911, and then opened, for the construction (including roof and ground surface drainage system), of the new building for the Bureau of Engraving and Printing, WASHINGTON, D. C., in accordance with drawings and specifications, copies of which may be obtained at this office at the discretion of the Supervising Architect.

JAMES KNOX TAYLOR, *Supervising Architect.*

TREASURY DEPARTMENT, Office of the Supervising Architect, Washington, D. C., Dec. 5, 1910.

SEALED PROPOSALS will be received at this office until 3 o'clock P.M. on the 16th day of January, 1911, and then opened, for the extension, remodeling, etc. (including plumbing, gas piping, heating apparatus, and electric conduits and wiring system), of the U. S. Post Office and Custom House at BATH, MAINE, in accordance with drawings and specification, copies of which may be obtained from the Custodian at Bath, Maine, or at this office at the discretion of the Supervising Architect.

JAMES KNOX TAYLOR, *Supervising Architect.*

TREASURY DEPARTMENT, Office of the Supervising Architect, Washington, D. C., Dec. 8, 1910.

SEALED PROPOSALS will be received at this office until 3 o'clock P.M. on the 12th day of January, 1911, and then opened, for Metal Vault Linings, Doors, etc., in the Extension to the U. S. Assay Office, NEW YORK, N. Y., in accordance with drawings and specification, copies of which may be had at this office or at the office of the Superintendent at the building, at the discretion of the Supervising Architect.

JAMES KNOX TAYLOR, *Supervising Architect.*

COMPETITION FOR A HOTEL IN AN AMERICAN CITY OF MODERATE SIZE.

FIRST PRIZE, $500. **SECOND PRIZE, $250.** **THIRD PRIZE, $150.**
FOURTH PRIZE, $100. **HONORABLE MENTIONS.**

COMPETITION CLOSES AT 5 P.M., MONDAY, JANUARY 16, 1911.

PROGRAM.

THE problem is a HOTEL OF MEDIUM SIZE, planned to meet the ordinary demands of a small American city. The site is assumed to be at the corner of two intersecting streets; the lot ample in size to accommodate the building and practically level.

The size and shape of the building are left entirely to the designer, except that not less than one hundred and not more than one hundred and twenty-five sleeping rooms are to be provided above the second floor. At least one-half of the sleeping rooms are to have bathrooms and the others may be provided with toilet and shower accommodations.

The ground or first floor plan is to provide the usual accommodations which are necessary in a hotel of this size.

The second floor plan may be given over in whole or in part for family suites, reception rooms, small meeting rooms, etc., etc.

The upper floor plan should provide for a large social hall to be used for banquets, dances, and similar functions. In connection with this social hall, and on the same floor, there should be provided suitable reception rooms, coat rooms, smoke room, service rooms, toilet rooms, etc., etc.

A roof garden may or may not be incorporated in the design.

It is assumed that the basement plan provides the necessary space for mechanical equipment, storage rooms, kitchen, lavatories, barber shop, and perhaps a rathskeller, but the plan of this floor is not required.

The exterior of the building is to be designed entirely in architectural terra cotta, and it is suggested that at least portions of the walls be treated in color.

The chief object of this competition is to encourage the study of the use of architectural terra cotta. There is no limit set on the cost of the building, but the design must be suitable for the character of the building and for the material in which it is to be executed.

The following points will be considered in judging the designs:

A. The general excellence of the design and its adaptability to the prescribed material.
B. The intelligence shown in the constructive use of architectural terra cotta.
C. Excellence of plan.

DRAWINGS REQUIRED.

On one sheet, the principal elevation drawn at a scale of 8 feet to the inch. On the same sheet, the first and second floor plans, a typical bedroom plan, and the upper floor plan, drawn at a scale of 16 feet to the inch; also a small sketch plan of the roof garden if that feature is provided for. On this same sheet, if space permits, give sketch of an interesting interior.

On a second sheet, the elevation of secondary importance drawn at a scale of 16 feet to the inch, and a sufficient number of exterior details drawn at a scale of ½ inch to the foot to fill the sheet.

The details should indicate in a general way the jointing of the terra cotta and the sizes of the blocks. The color scheme is to be indicated either by a key or a series of notes printed on one of the sheets.

The size of each sheet (there are to be but two) shall be exactly 36 inches by 24 inches. Strong border lines are to be drawn on both sheets, 1 inch from edges, giving a space inside the border lines 34 inches by 22 inches. The sheets are to be of white paper and unmounted.

All drawings are to be in black ink, without wash or color, except that the walls on the plans and in the sections may be blacked-in or cross-hatched.

Graphic scales to be on all drawings.

Each set of drawings is to be signed by a *nom de plume*, or device, and accompanying same is to be a sealed envelope with the *nom de plume* on the exterior and containing the true name and address of the contestant.

The drawings are to be delivered flat, or rolled (packaged so as to prevent creasing or crushing) at the office of THE BRICKBUILDER, 85 Water Street, Boston, Mass., charges prepaid, on or before January 16, 1911.

Drawings submitted in this competition must be at owner's risk from the time they are sent until returned, although reasonable care will be exercised in their handling and keeping.

The prize drawings are to become the property of THE BRICKBUILDER, and the right is reserved to publish or exhibit any or all of the others. Those who wish their drawings returned may have them by enclosing in the sealed envelopes containing their names, ten cents in stamps.

The designs will be judged by three or five well-known members of the architectural profession.

For the design placed first in this competition there will be given a prize of $500.
For the design placed second a prize of $250.
For the design placed third a prize of $150.
For the design placed fourth a prize of $100.

The manufacturers of architectural terra cotta are patrons of this competition.
The competition is open to everyone.

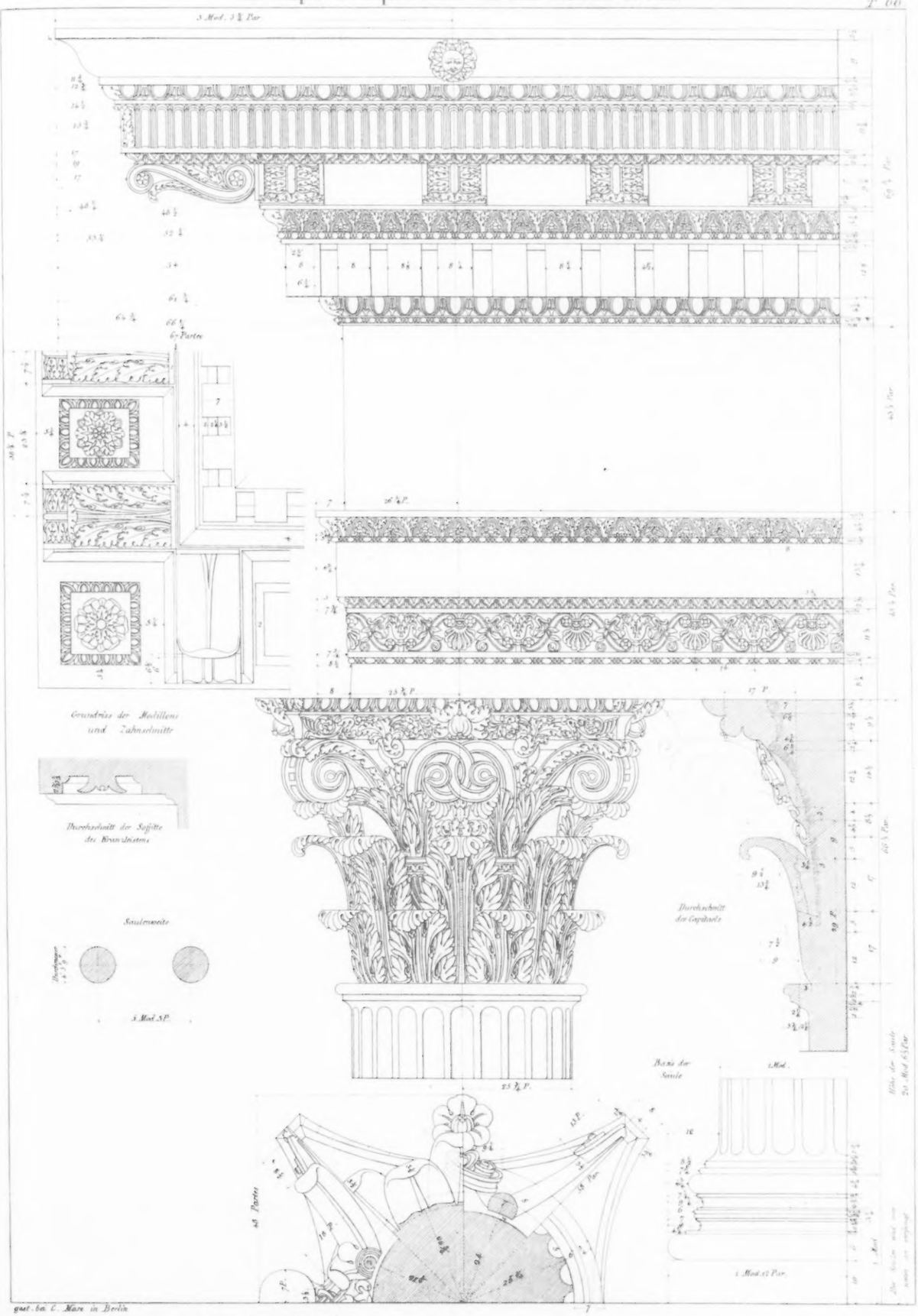
THE ARCHITECTURAL REPRINT

SAMPLE PLATE FROM THE GREEK AND ROMAN ORDERS, BY MAUCH

SEE OVER

GEBALK, BASIS UND CAPITAEL DER KORINTHISCHEN ORDNUNG

Vom Tempel des Jupiter Stator auf dem Kuhfelde zu Rom



THE ARCHITECTURAL REPRINT VOLUME X. PLATE 94.

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PLATE 66.

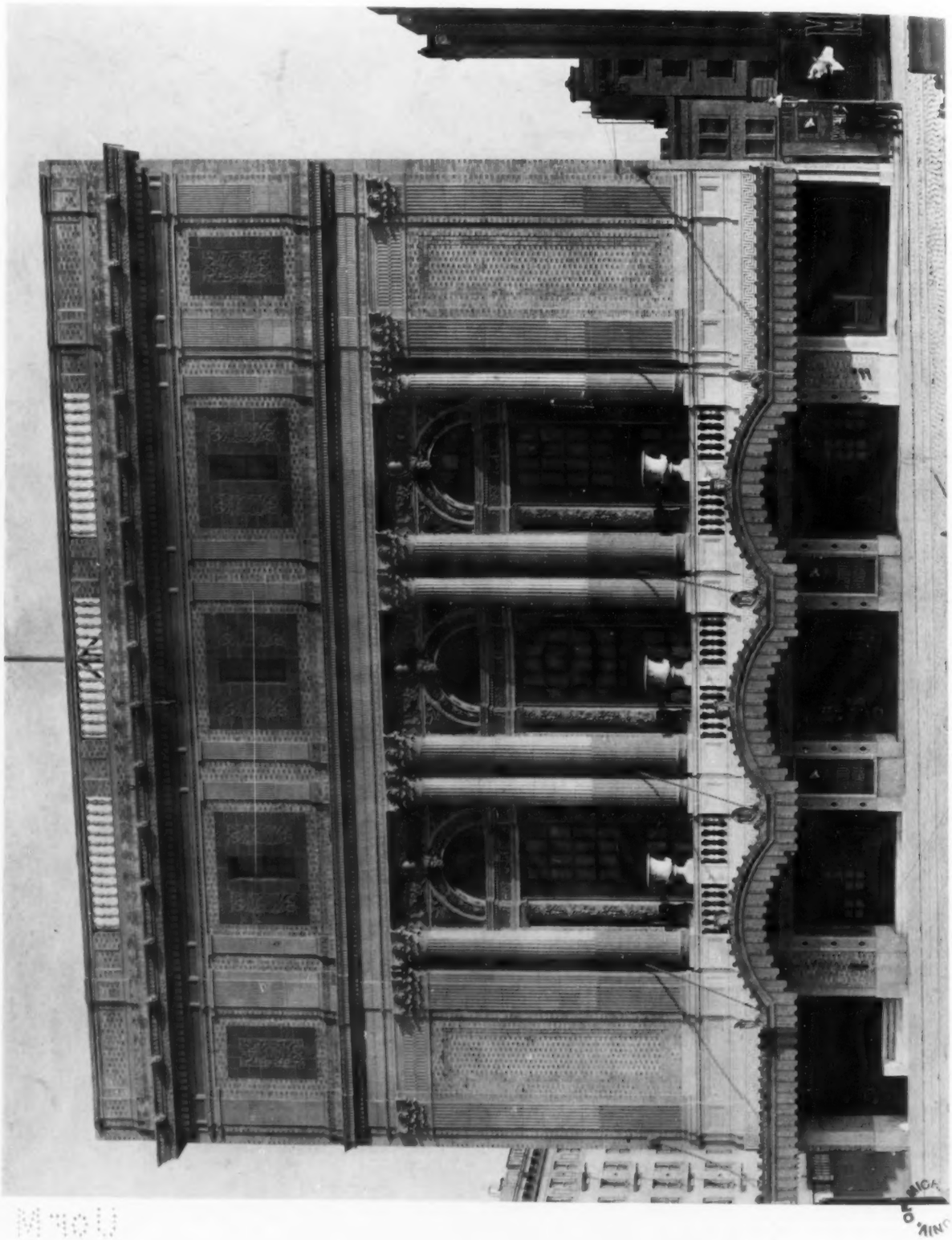
FROM THE TEMPLE OF JUPITER STATOR.

Near the original principal forum at Rome, and near the ruins of the Basilica Julia, stand three columns, with a portion of the entablature, from the peristyle of a Corinthian Peripteral Temple of 8 and 13 columns. These three columns are from one of the long sides and stand on a common foundation of 6.28 meters in height. For a long time they were considered as the remains of the Temple of Jupiter Stator, or Castor and Pollux. The later explorations, however, have established these ruins to be of the Temple of Minerva, which was erected of Pentelic marble by Domitian about the end of the first century A. D.

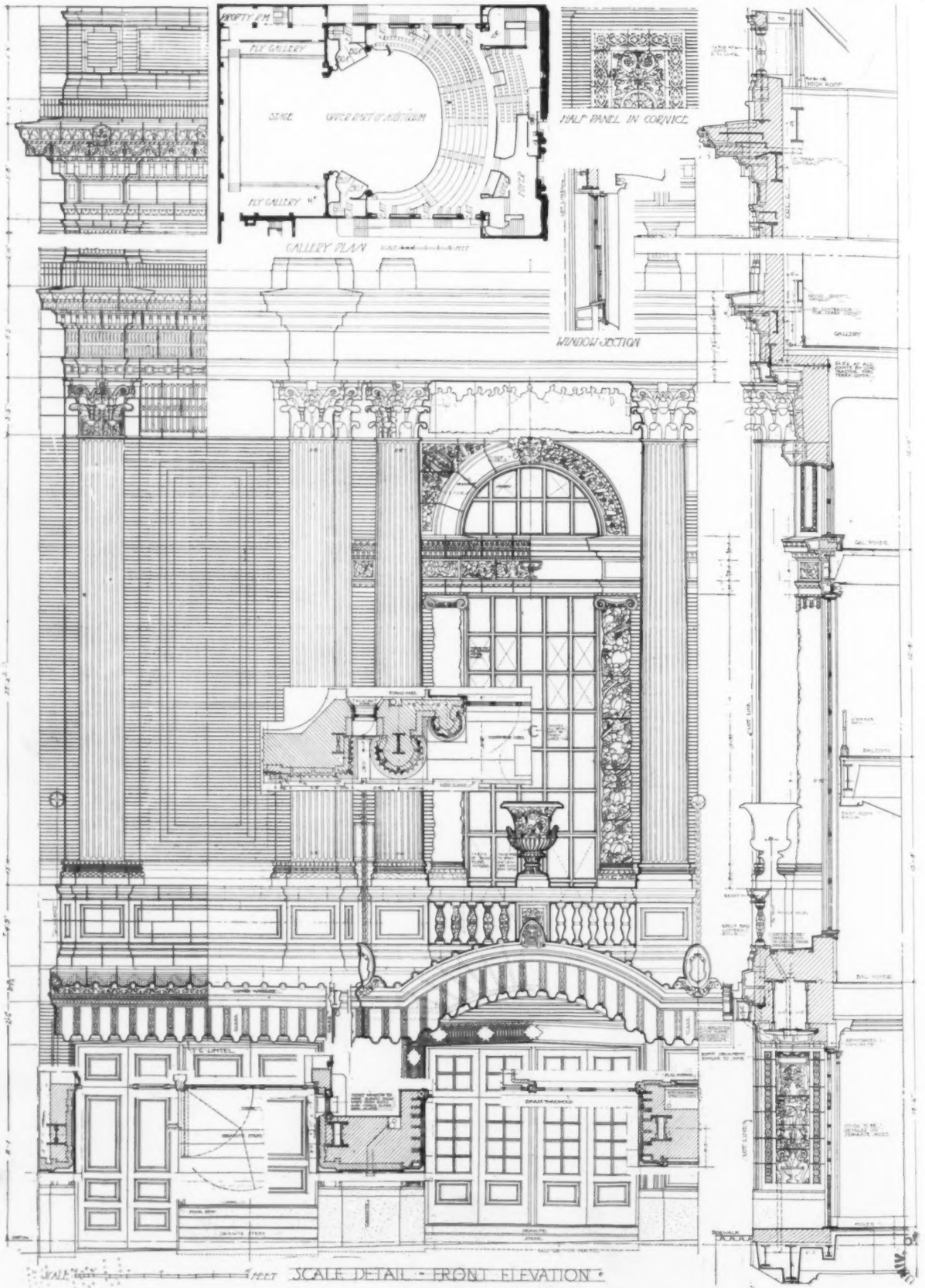
The scant remains indicate the majesty and beauty with which the entire structure was clothed. The architecture is of great originality, not overloaded, and of noble proportions and exquisite execution.

The leafwork of the capital has more spirit than that on the Pantheon. The volutes are larger, of splendid form and more decorative, those in the center being entwined. Out of the stem from which they spring also grows a fine ornament which spreads itself on the surface of the abacus.

The entablature as a whole is of strong proportions and still not heavy, while the details and ornamentation, of admirable character and relation, are arranged with a fine balance and the dominating members stand in excellent harmony with one another. In order that the wide corona should not appear too massive, it is decorated with an upright row of leaves which actually remind one of the Roman name of this member, corona. The dentil member is here divided into dentils. The minor mouldings are considerably subordinated, and enriched with rare taste. The flower band decoration of the middle fascia of the architrave seems out of place. The soffit of the architrave is found on Plate 87.



COLUMBIA THEATRE, SAN FRANCISCO, CAL.
BLISS & FAVILLE, ARCHITECTS.



COLUMBIA THEATRE, SAN FRANCISCO, CAL.

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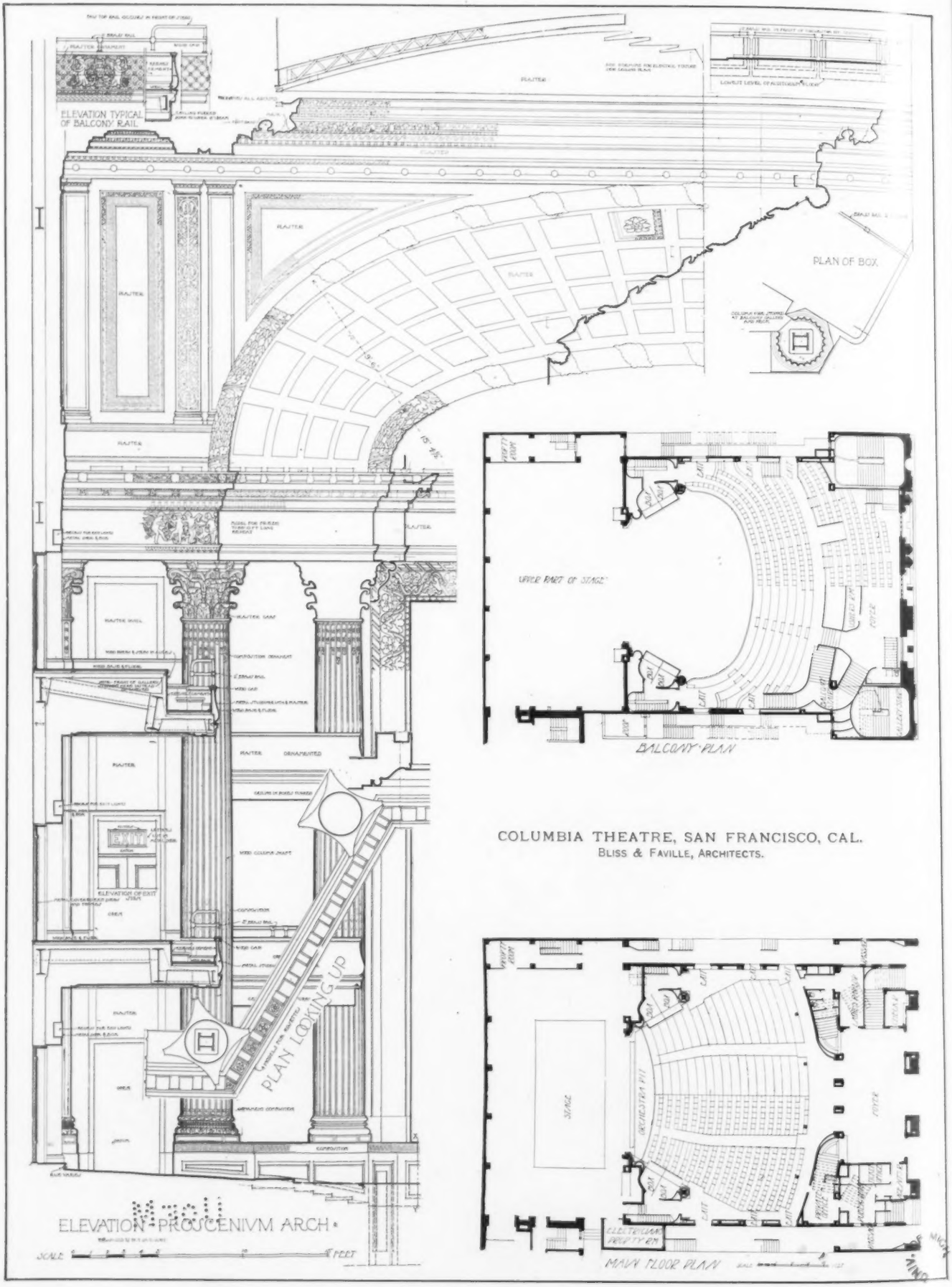

COLUMBIA THEATRE, SAN FRANCISCO, CAL.

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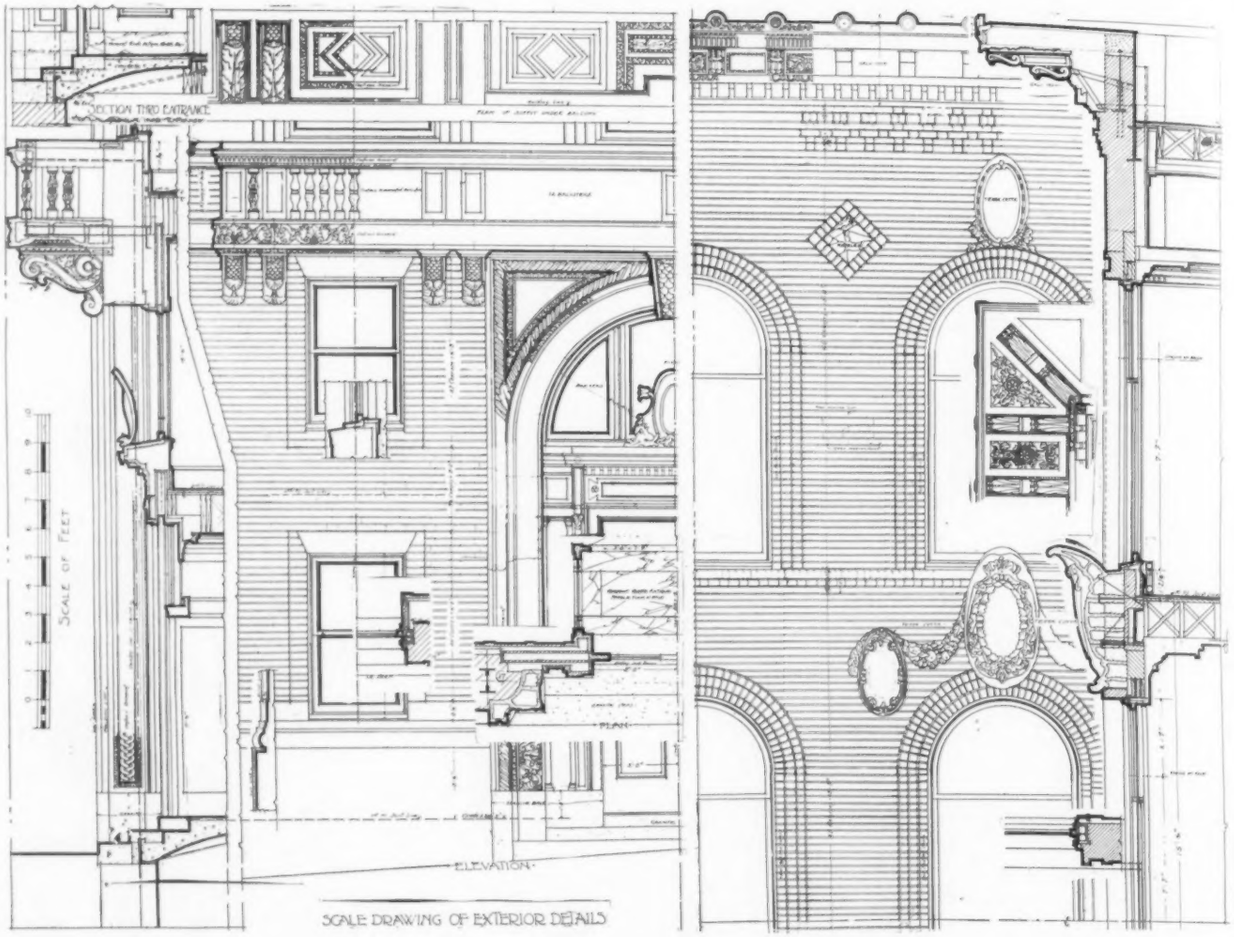
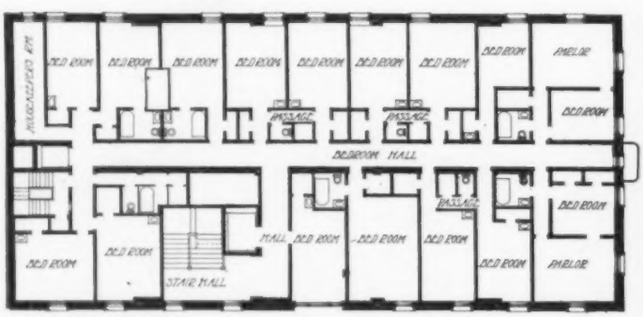
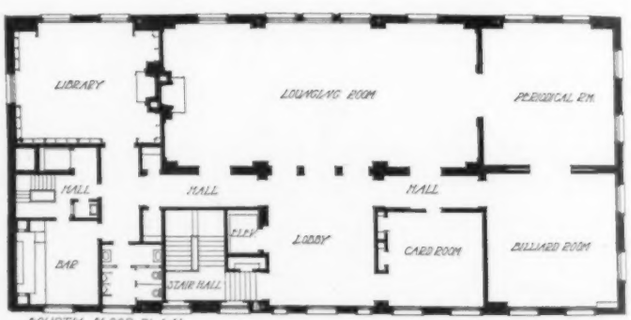
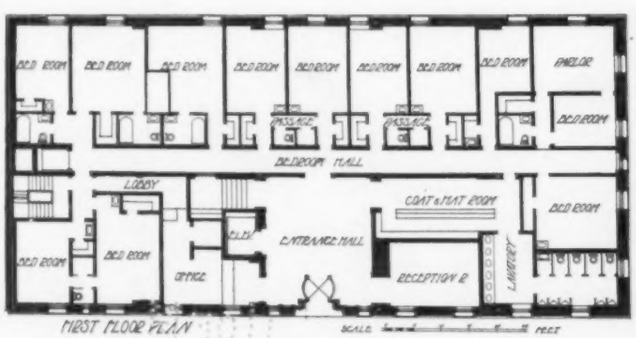
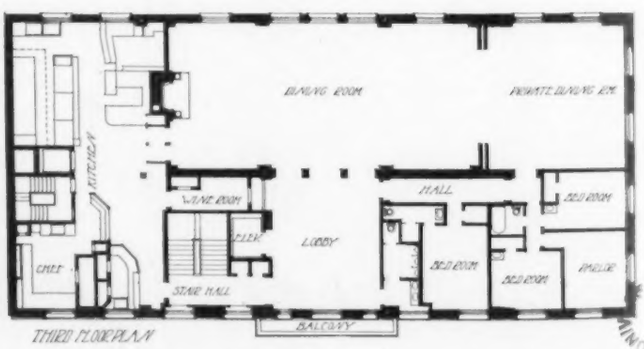
UNIVERSITY CLUB, SAN FRANCISCO, CAL.
BLISS & FAVILLE, ARCHITECTS.











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HOUSE AT 135 EAST 19TH STREET, NEW YORK CITY.
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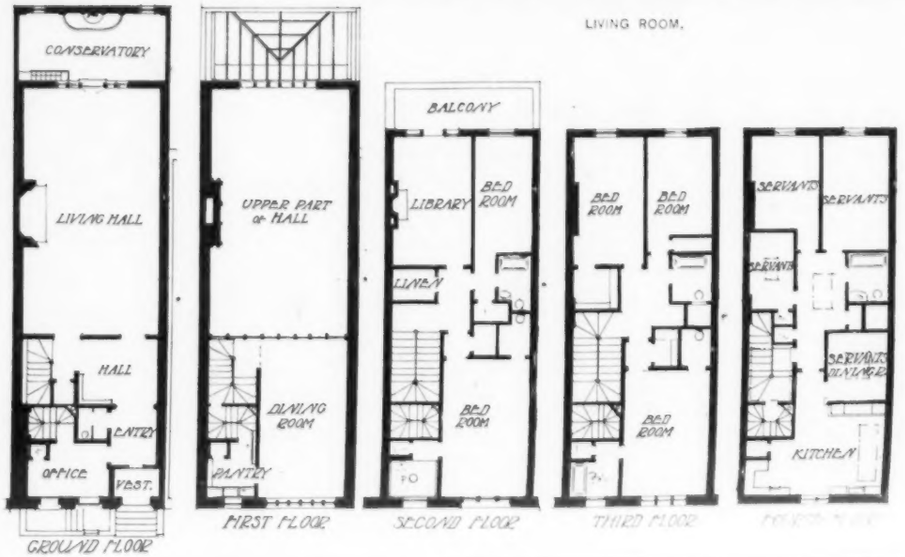
LIVING ROOM.



LIBRARY.

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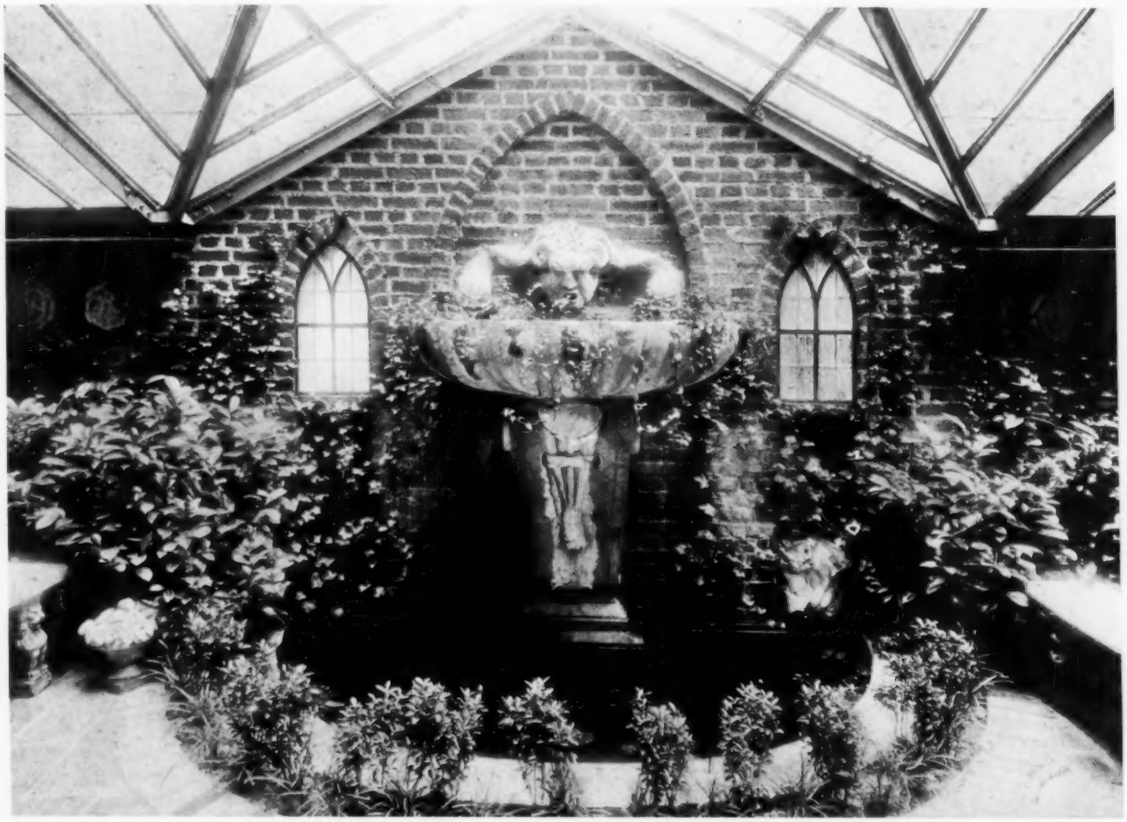
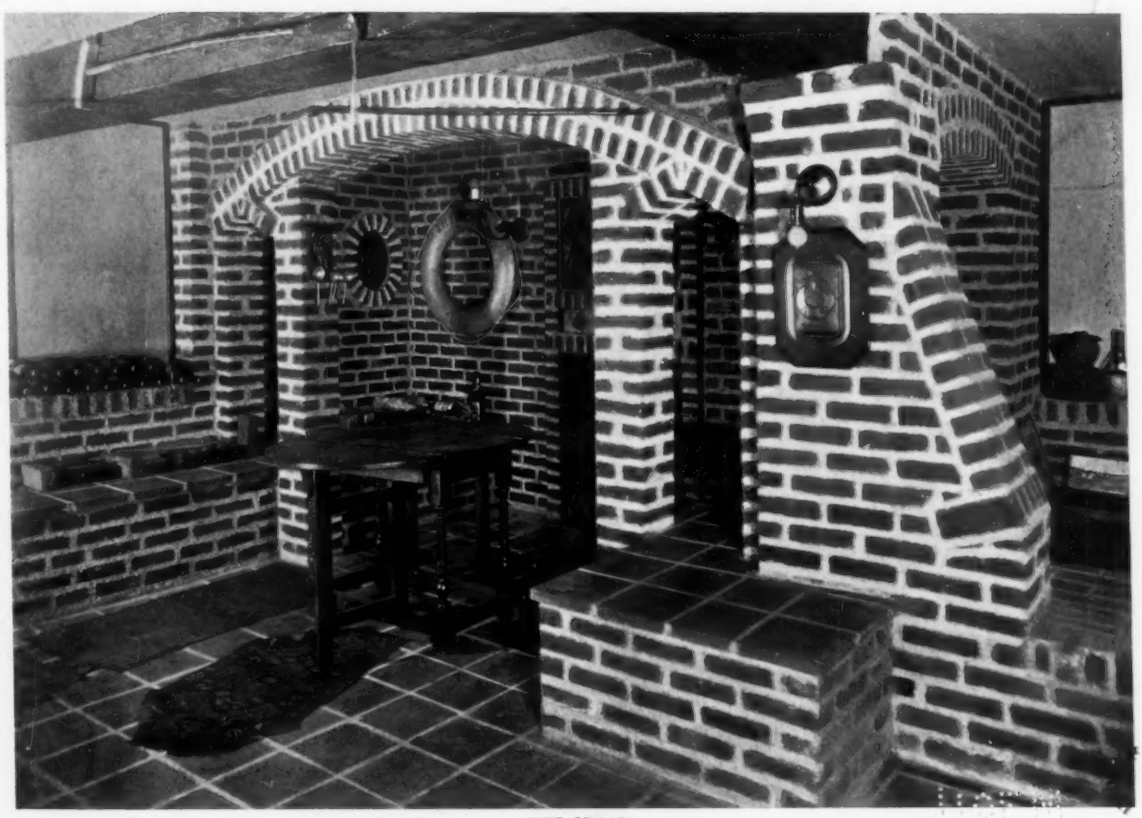


CONSERVATORY.



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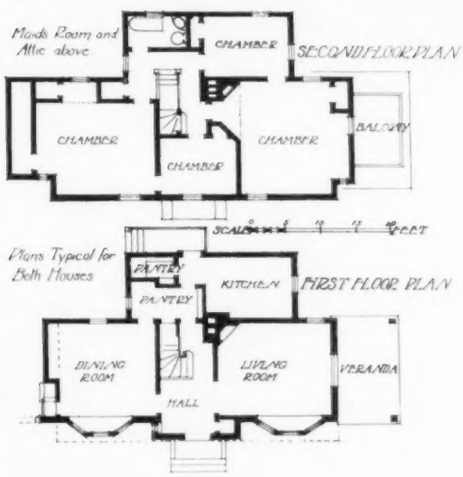

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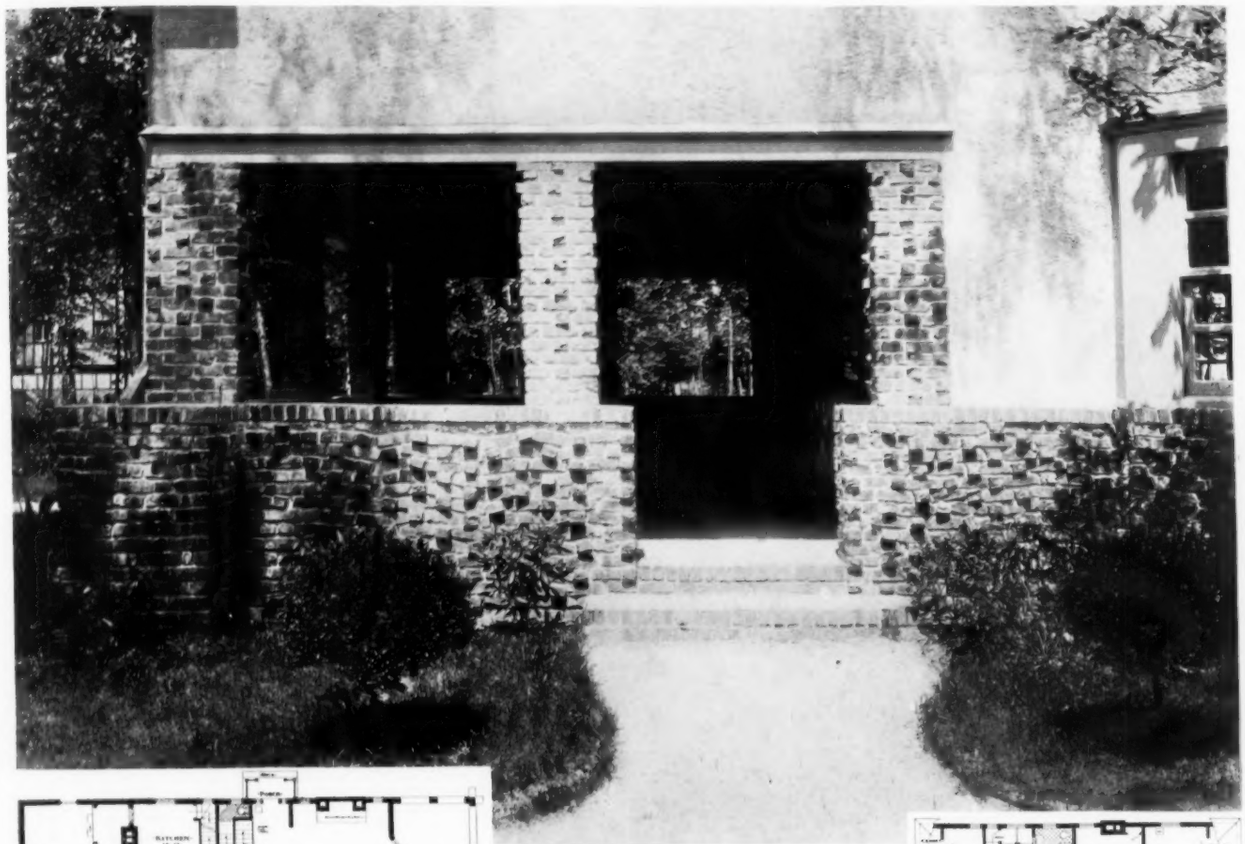

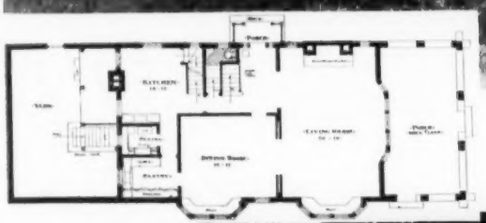

FIRST FLOOR.

HOUSE AT BELLE TERRE,
LONG ISLAND, N. Y.

FREDERICK JUNIUS STERNER, ARCHITECT.

SECOND FLOOR.

FIRST FLOOR.

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Program for The Brickbuilder Annual Terra Cotta Competition, page 286

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